TOOL HALL

October · 1955

finish

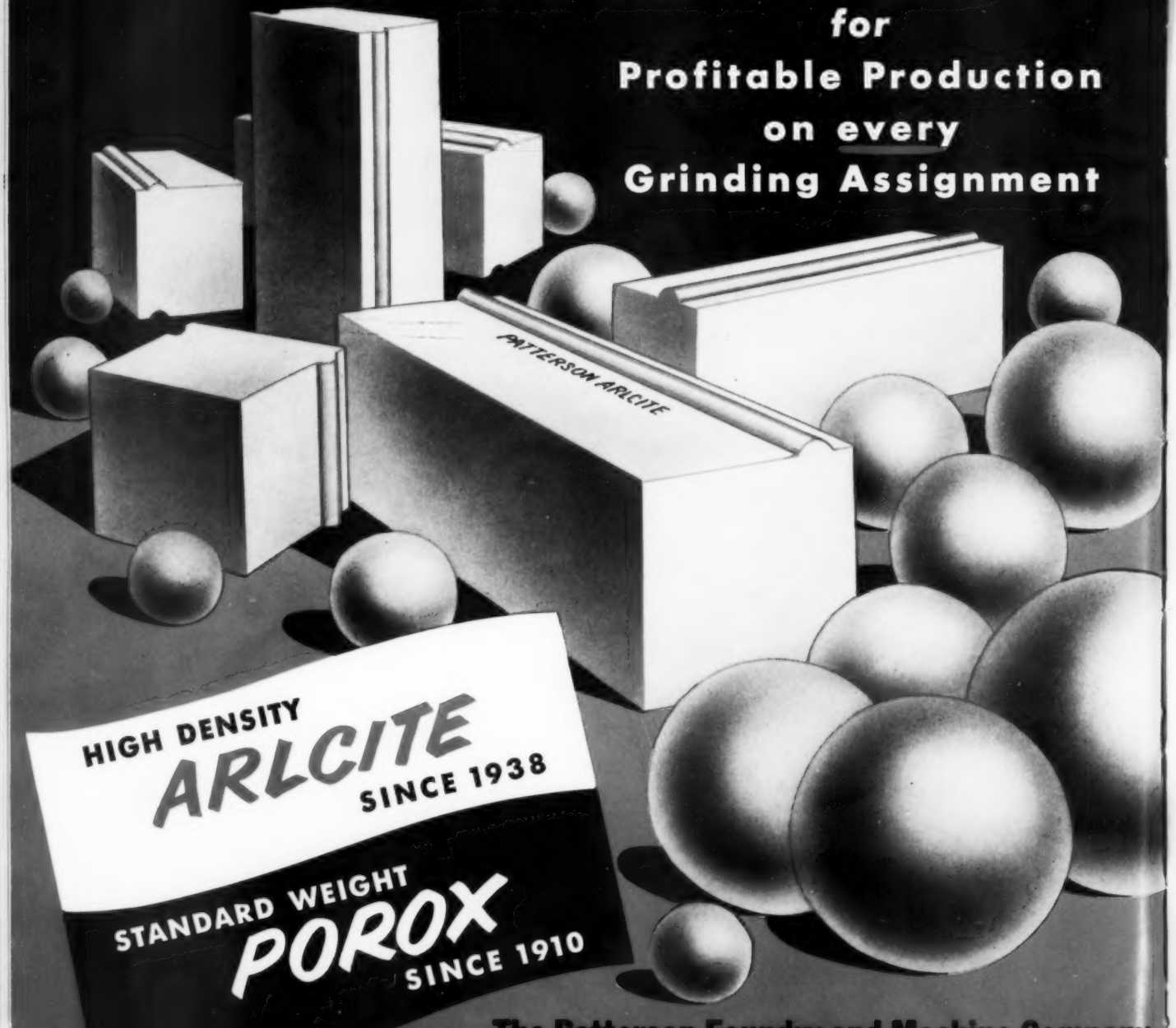
THE MAGAZINE OF

Appliance AND Metal Products MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

Patterson

HIGH DENSITY ARLCITE
LININGS AND GRINDING MEDIA
for
Profitable Production
on every
Grinding Assignment



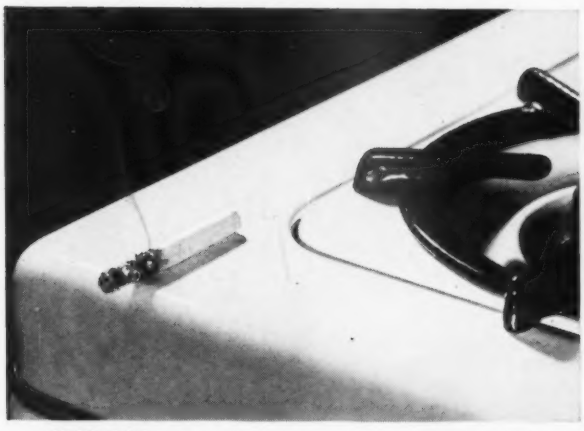
HIGH DENSITY
ARLCITE
SINCE 1938

STANDARD WEIGHT
POROX
SINCE 1910

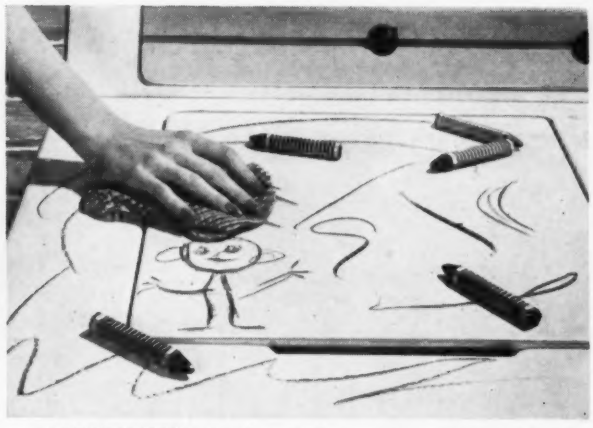
The Patterson Foundry and Machine Company
East Liverpool, Ohio, U. S. A.
NEW YORK, BOSTON, BALTIMORE, PHILADELPHIA, PITTSBURGH, DETROIT, CINCINNATI, ATLANTA, CHICAGO, ST. LOUIS, HOUSTON, DENVER, LOS ANGELES, SAN FRANCISCO, SEATTLE

The Patterson Foundry and Machine Company, (Canada) Limited
Toronto, Canada
MONTREAL

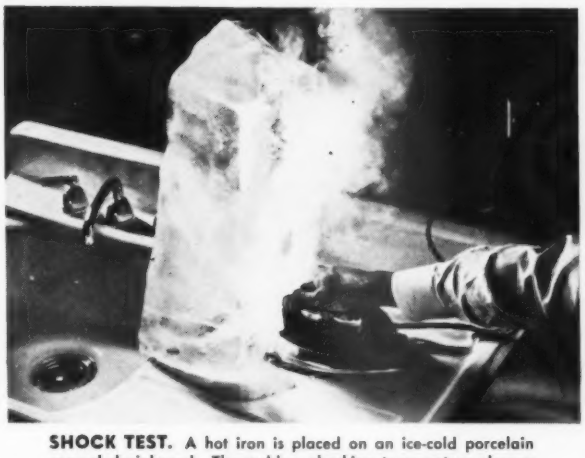
PORCELAIN ENAMEL in your products would pass all these tests...



HEAT TEST. The red-hot embers of a burning cigarette don't damage the rock-like surface of porcelain enamel. Its glistening finish does not scorch or discolor as many kitchen surfaces do.



LIPSTICK TEST. Lipstick or children's crayons won't mar the hard, lustrous finish of porcelain enamel. A damp cloth quickly wipes away stains and dirt leaving the surface bright as new.



SHOCK TEST. A hot iron is placed on an ice-cold porcelain enamel drainboard. The sudden, shocking temperature change does not affect it. Many coatings would blister, buckle or discolor.

SCRATCH TEST. Vegetables or fruits for a salad can be cut on porcelain enamel without damaging the surface. Many work surfaces show dents or scars from knives or other sharp utensils.

If you make products that might benefit from the sales advantages of porcelain enamel, why not consider this lifetime finish the next time you redesign? Then you can offer products in a range of colors that don't fade or lose luster.

Experienced job enamelers are ready to work with you—not only on design problems but in the production of porcelain enameled parts. For nearly half a century many of these enamelers have specified Armco Enameling Iron as the base metal for their products. They know it is assurance of uniform quality from one shipment to the next. That's why it has become known as the "World's Standard Enameling Iron." Just fill in and mail the coupon for complete information.

ARMCO STEEL CORPORATION, 375-B Curtis St., Middletown, Ohio

Give me names of job enamelers

We manufacture _____

Name _____

Company _____

Street _____

City _____ Zone _____ State _____

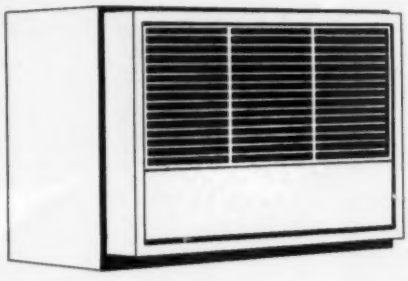
ARMCO STEEL CORPORATION MIDDLETOWN, OHIO

SPECIAL STEELS

SHEFFIELD STEEL DIVISION · ARMCO DRAINAGE & METAL PRODUCTS, INC. · THE ARMCO INTERNATIONAL CORPORATION

LORD HALL LIBRARY

It's June in January



when products are finished with . . .

IC PASTEL RINCONTROL

In the office or the home, a typewriter or air-conditioner, when it's finished with one of these exciting new IC pastel wrinkles, will create an atmosphere of freshness and cheer strongly reminiscent of a day in June.

IC PASTEL WRINKLE FINISHES PROVIDE:

- Delicate shades of blue, green, pink, tan, coral, ivory and oyster white.
- Fine, uniform texture.
- Freedom from discoloration on baking.
- Hardness and mar-proofness.
- Excellent abrasion and perspiration resistance.
- Consistently trouble free production.

Give your product a breath of spring. Join the trend to color with IC PASTEL RINCONTROL.

Interchemical
Corporation
Finishes Division

FACTORIES: CHICAGO, ILL. • CINCINNATI, OHIO
ELIZABETH, N. J. • LOS ANGELES, CAL.
NEWARK, N. J. • MEXICO CITY, MEX.

In Canada, IC products are sold by AULCRAFT PAINTS LTD., Toronto, Ont., under its trademarks.

finish

MONTHLY TRADE PUBLICATION
Established January 1944
Published by
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York Street at Park Avenue
Elmhurst, Illinois
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A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. Includes technical and practical information on plant facilities and manufacturing problems from raw metal to safe delivery of the finished product, with special emphasis on fabrication, metal preparation, metal finishing, assembly, and packaging and shipping.

Free controlled circulation to management, purchasing, engineering and key plant personnel in metal product manufacturing plants. To others, subscription price is $5.00 per year, domestic. To all other countries $8.00 per year (U.S. funds).

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BPA NBP

finish

METAL PRODUCTS MANUFACTURING
FROM RAW METAL TO FINISHED PRODUCT

Hang on lightweight Inconel

...for years of economical rod service

Have you tried Inconel* nickel-chromium alloy for hanger rods?

For long run economy in this service, you can depend upon Inconel.

Within standard enameling temperature ranges (1475 to 1550°F.) and on up to the range where high temperature ceramic coatings are applied (1850°F. approximately), Inconel nickel-chromium alloy delivers excellent heat and corrosion resistance. It resists oxidizing and other corrosive conditions common in enameling operations.

At those temperature levels, this nickel-chromium alloy retains high creep strength. Even after years of continuous operation, Inconel rods of proper design show no stretch.

A change to wrought, light-weight Inconel rods can mean lower fuel costs, too. For, with less dead weight in the furnace, it takes less fuel to get to heat and stay there.

What's true of this alloy for drop rods, is equally true for burning tools and furnace parts.

So, if heat and corrosion are creating problems with items of this type, see what Inconel nickel-chromium alloy can do. You can get more information by writing for "Keep Operating Costs Down . . . When Temperatures Go Up." It's free and a useful booklet to have. For detailed technical assistance, call on Inco's Technical Service Section.

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

*Registered Trademark

Nickel Alloys

Inconel . . . ***for long life at high temperatures***

Complete STAMPING FACILITIES

FOR APPLIANCE AND METAL PRODUCTS MANUFACTURERS

Specializing in DEEP DRAW parts *in* BRASS-STEEL-ALUMINUM-STAINLESS STEEL

Danielson is equipped for COMPLETE SERVICE from precision tooling to the finished product — whether it's a simple stamping or a precision deep draw — Danielson can save you money.

Our complete facilities include: Tool and Die Department — Press Department — Shearing — Circle Shear — Spot Welding — Arc Welding — Silver Soldering — Hydrogen Brazing — Polishing — Degreasing — Painting — Assembling.

Let your most difficult job be a challenge to us to be turned into a saving for you!

Shown below is a Steel Tank made in two draws. 12" scale shows comparative size. Above are various sizes and shapes all drawn to exact specifications.

99% pure aluminum part 23" dia — 13" deep, shown above, was drawn on our 300 ton Hydraulic Press.

Write - phone or wire today ....

V. W. DANIELSON
MANUFACTURING COMPANY

3360 W. HOPKINS ST. • MILWAUKEE 16, WISCONSIN • Phone CUSTER 3-3800

it's as easy as this...

FOR
COLUMBUS STOVE

PERMA-VIEW

the window you can see through always!

"out of our carton— into your door"

Yes sir, it's as easy as this. The PERMA-VIEW oven door window comes to you ready for immediate installation in your range — to add a sales feature second to none.

The strong steel encased, double pane PERMA-VIEW window incorporates the finest quality heat resisting glass. It is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging." This "non-fog" window meets the constantly growing demand for "visible baking."

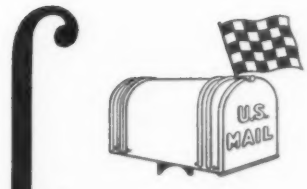
More and more range manufacturers are turning to PERMA-VIEW as a practical, economical and effective sales feature for their new models. We will gladly work with your engineering department in adapting its use to your range. Write or phone for complete information.

Phone MArket 4-2256

The Columbus Stove Company's Model 80 KTBG Divided Top Range features the PERMA-VIEW window. Columbus Stove also uses the PERMA-VIEW window in its 36-inch cluster top model and in a 20-inch apartment size model in their 1955 line.

MILLS PRODUCTS, INCORPORATED

1015 W. MAPLE ROAD • WALLED LAKE, MICHIGAN



finish SUGGESTION BOX

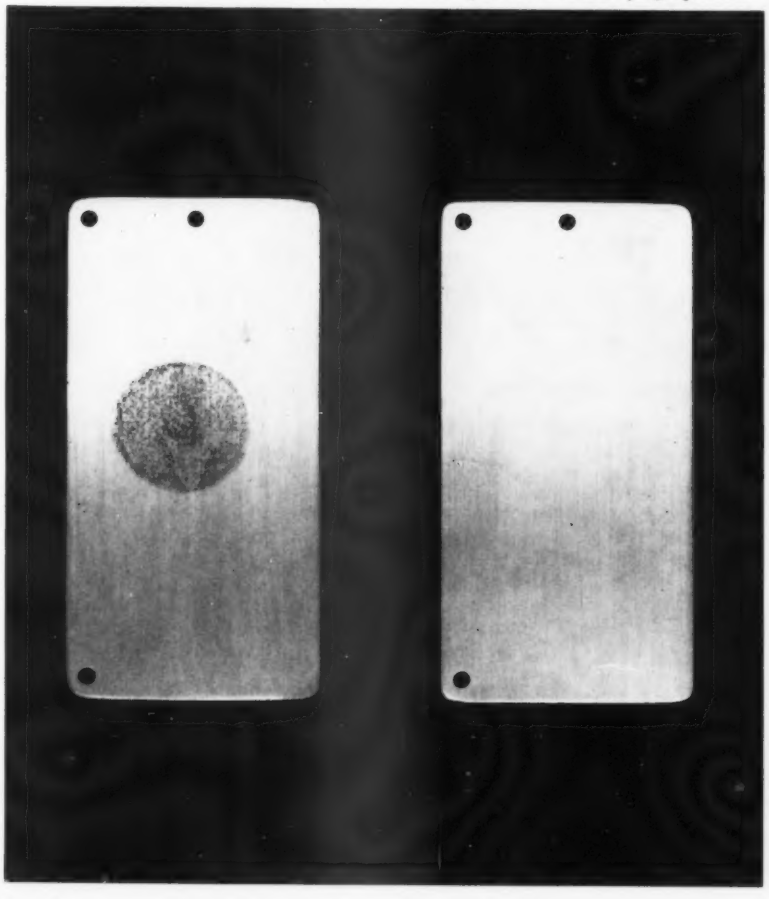
New fingerprint remover for industrial use

A NEW chemical compound, known as Cosmoline 1070, is said to be especially useful in protecting highly-polished or super-finished surfaces from corrosion caused by the lactic acid, urea and sodium chloride residue of ordinary fingerprints. It is particularly effective on non-ferrous metals and bi-metallic assemblies.

Other features of the fingerprint remover include a rupture-resisting film which it provides to allow safe handling of treated parts, easy removal by solvent prior to application of final finishes, non-toxicity, high anti-humidity properties and long stability in storage.

The manufacturer reports that the compound meets Government Specification MIL-C-15074A for "Compound Corrosion Preventive, Fingerprint Remover."

Before and after illustration of how the compound removes fingerprints.



Source for more information on this fingerprint remover may be obtained by writing to *finish*.

SUPPLIER NEWS

MARSCO EXPANDING PLANT FACILITIES

A. G. Feldmeier, president, Marsco Mfg. Co., Chicago, has announced that construction has been started on a two-story addition of approximately 12,000 sq. ft. to present plant facilities This will provide enlarged factory area, administrative offices and dock facilities.

It was also announced that negotiations have been completed for the purchase of additional facilities in Chicago containing approximately 35,000 sq. ft., which will be utilized for light manufacturing and warehousing.

JARECKI EXPANSION PLANS

Jarecki Corp., Grand Rapids, Mich., has put into effect an approximate $1,250,000 expansion program which includes new machinery and equipment and the construction of a modern addition to one of its plants.

DU PONT EXPANDS CERAMIC RESEARCH LABS.

E. I. du Pont de Nemours & Co., Inc. has completed a major expansion and modernization of the ceramic research and sales service laboratories at its Electrochemicals Dept. plant in Perth Amboy, N.J., announnced L. H. Fletemeyer, Jr., plant manager.

The laboratories, under the direction of Dr. Kermit H. Ballard, are equipped to carry out fundamental ceramic research and to supply technical service to the ceramics, electronic and other industries.

when the time comes...

for new and better glass products — whether it be today or 2000 A.D. — Marsco's craftsmen engineering team will develop them.

The Junior Spaceman above has the best in interplanetary protection — a glass space helmet — because glass can be bowed to fit any desired shape and yet it can be tempered to impart extreme resistance to impact.

You or your family don't need space helmets today but chances are glass could improve the utility and beauty of your product and make it more salable today.

Let Marsco's craftsmen engineering team impart to your product all the advantages of glass.

ask for the man from

Marsco

Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:

- CLOCK & TIMER CRYSTALS
- OVEN DOORS
- RADAR EQUIPMENT
- AIRCRAFT ACCESSORIES
- PHOTOGRAPHIC EQUIPMENT
- LIGHT LENSES
- DIALS & NAME PLATES
- TELEVISION EQUIPMENT
- INSTRUMENTS
- MEDICAL EQUIPMENT

Special shapes for: Instruments, Gauges, Household and Industrial Appliances.

MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.

HOW COME !

WE HAVE BEEN ABLE TO
PRODUCE A SUPERIOR FRIT FOR

GLASS LINED WATER HEATERS

WHICH PROVIDES:

1. GREATER WATER RESISTANCE
2. LESS POROSITY
3. HIGHER PERCENTAGE OF ONE-COAT APPLICATIONS
4. WIDER RANGE OF FIRING TEMPERATURES
5. MORE WORKABILITY

THERE IS NO SUBSTITUTE FOR *KNOW-HOW!*

We have important job enameling water heater customers who demanded certain results.

Our No. 700 Water Heater Enamel is the answer . . . the result of that all-important "KNOW-HOW" which comes as a result of exhaustive laboratory research by our top flight ceramic engineers, working hand in hand with actual production conditions in our own large job enameling plant.

Ing-Rich plant-tested ceramic engineers and plant-tested Frit can give you the results *you* want—there is no substitute for "Know-How."

INGRAM-RICHARDSON, INC.

OFFICES, LABORATORY AND PLANT • FRANKFORT, INDIANA

ING-RICH
FRIT
"The Plant Tested Frit"

McDANEL

VITREOUS PORCELAIN *Grinding Balls*

MADE FROM A SPECIALLY DEVELOPED BODY FOR...

Long Wear

McDanel Ceramic Grinding Balls are fired over a long period of time at controlled temperatures, assuring complete vitrification. This care in manufacturing has given them an impressive history of long wear and dependable grinding.

Purity

McDanel Ceramic Grinding Balls, sold since 1919, have been the standard in ball mill operations where purity is of prime importance. They are manufactured with exacting control, assuring uniform content and pick up, lot after lot.

Better Impact Resistance

It is the specially developed body which gives McDanel Ceramic Grinding Balls their excellent impact resistance. After firing, a slow, thorough cooling process prevents any strains being set up. It is this almost complete absence of cooling strain which prevents chipping or cracking.

Uniform Grinding

Naturally, uniformity is of prime importance in any grinding operation . . . both in grinding media and end result. McDanel Ceramic Grinding Balls are hand rolled with no seams to break or chip.

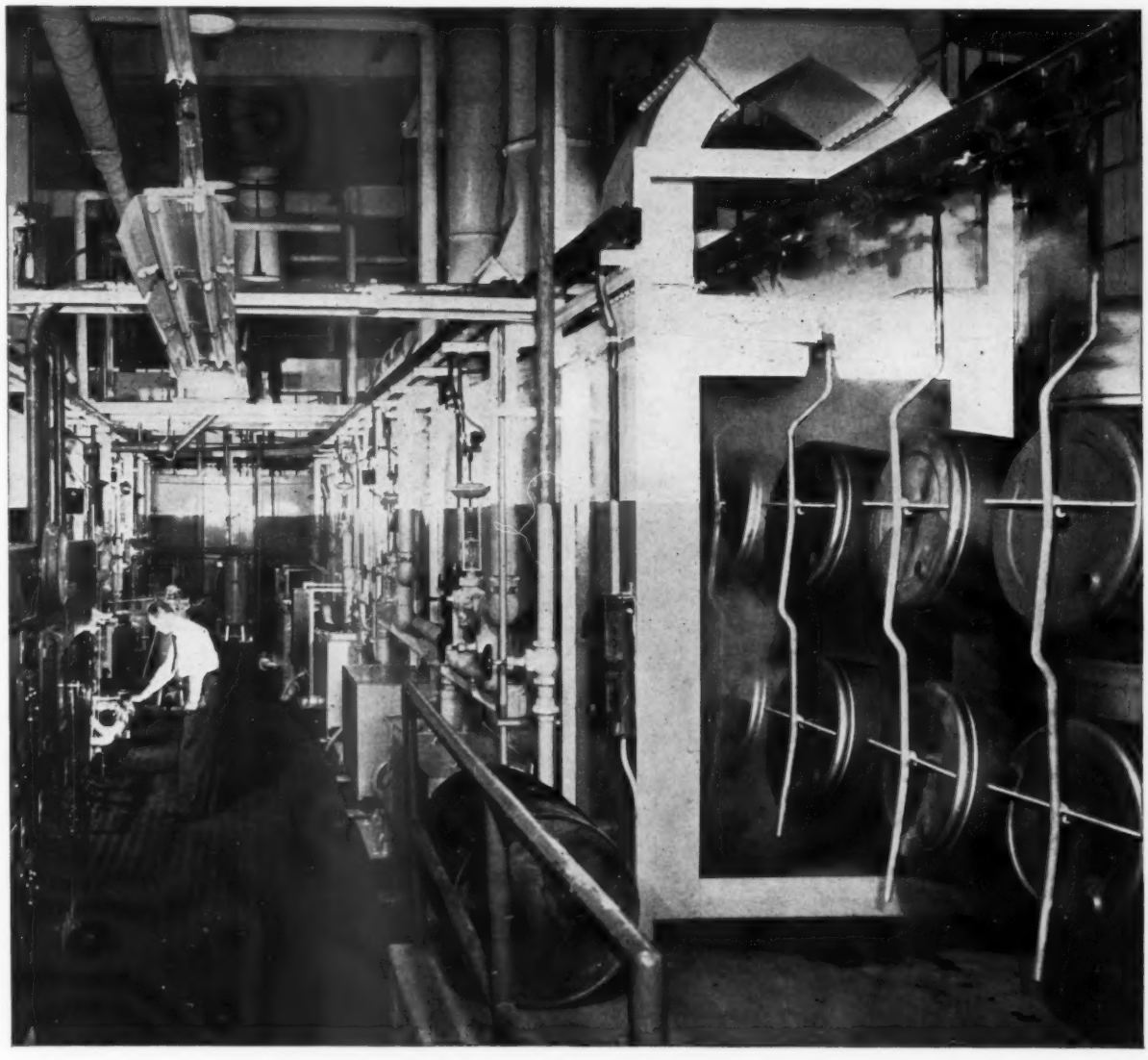
WRITE FOR YOUR McDANEL INDUSTRIAL CERAMIC CATALOG TODAY!

McDANEL Industrial PORCELAINS

McDANEL

REFRACTORY PORCELAIN COMPANY

BEAVER FALLS · PENNSYLVANIA



SPRUCE UP YOUR SPRAY LINE!

Two new Pennsalt Cleaners put new life into your old spray washers

Your elaborate spray washing machines are no better than the quality work they produce in the shortest time, with the fewest re-runs. By selecting the proper Pennsalt cleaners you can increase the efficiency of your spray wash operation, put more profits in your pocket. Here are two new Pennsalt cleaners with distinct advantages.

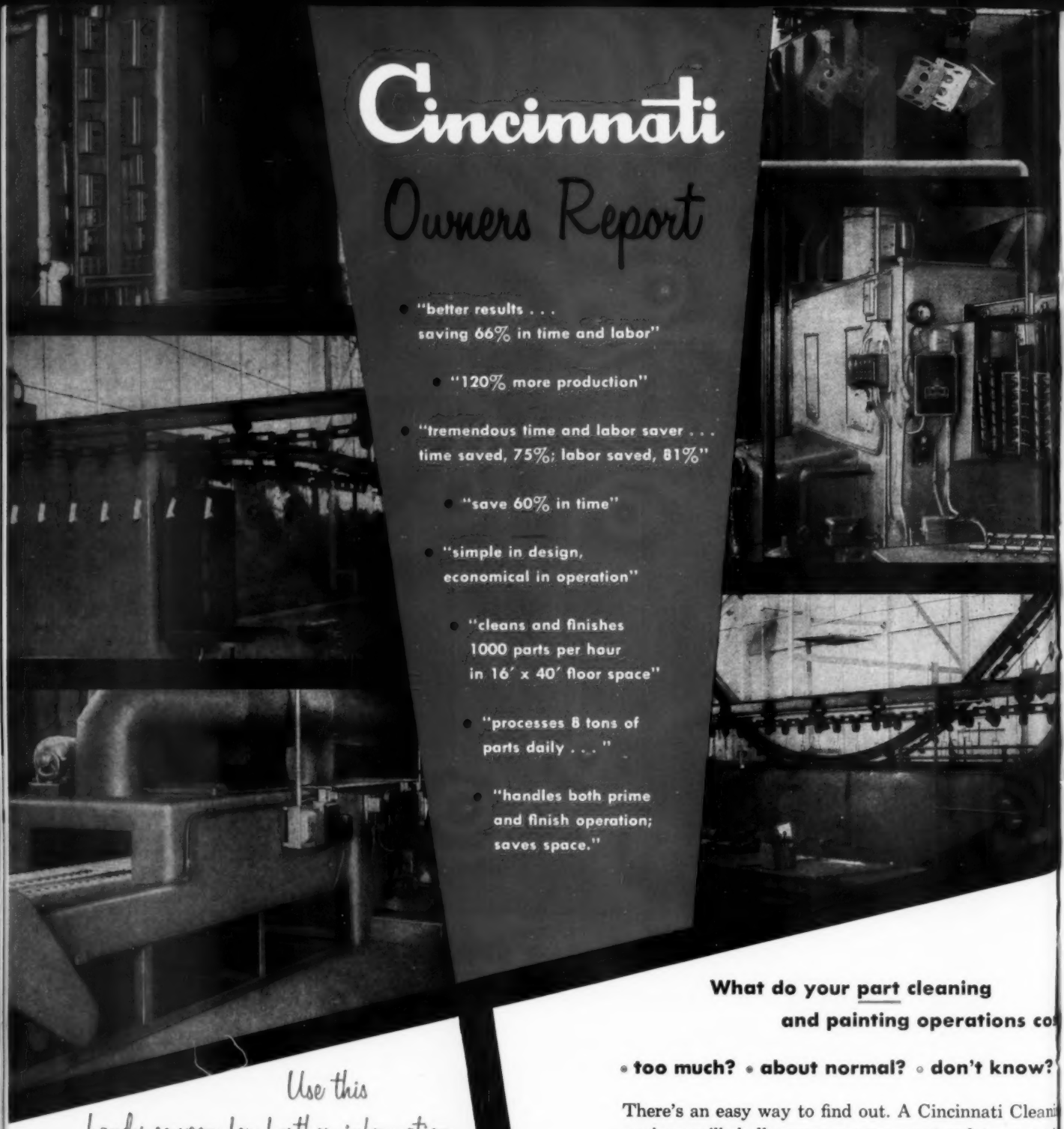
PENNSALT CLEANER 38—a heavy duty spray cleaner for strong detergent action and trouble-free operation. Pennsalt Cleaner 38 has excellent hard water resistance, good rinseability, exceptional detergency! Users tell us Cleaner 38 "sets a new standard of cleanliness."

PENNSALT CLEANER EC-54—an emulsion cleaner which will not boil off, evaporate, or flash at *high use temperatures* between 160 and 200° F. Pennsalt Cleaner EC-54 removes really tough soils from hard-to-clean parts. Non-ferrous metals are cleaned without tarnishing—one cleaning unit can be used to process *all* metals. EC-54 also provides *rust inhibition*. Ferrous parts are protected against in-plant rusting for 1 to 6 weeks.

You can learn all about these new, superior cleaners from your Pennsalt specialist in metal cleaning chemicals. Call him now—or write to us for specific recommendations. Metal Processing Dept., Pennsylvania Salt Manufacturing Company, EAST: Three Penn Center Plaza, Philadelphia 2, Pa. WEST: Woolsey Bldg., 2168 Shattuck Ave., Berkeley 4, Calif.

Pennsalt Chemicals

A BETTER START FOR YOUR FINISH



Cincinnati

Owners Report

- "better results . . . saving 66% in time and labor"
- "120% more production"
- "tremendous time and labor saver . . . time saved, 75%; labor saved, 81%"
- "save 60% in time"
- "simple in design, economical in operation"
- "cleans and finishes 1000 parts per hour in 16′ x 40′ floor space"
- "processes 8 tons of parts daily . . . "
- "handles both prime and finish operation; saves space."

What do your part cleaning and painting operations co

• too much? • about normal? • don't know?

There's an easy way to find out. A Cincinnati Cleani engineer will gladly survey your present or future requi ments and give you a no-cost, no-obligation answer th may point to savings as important as those quoted abo

Whether you're interested in cleaning alone or a spa time and labor-saving integral finishing system, Cinc nati has the experience and technical knowledge to g you a straightforward estimate of possible savin

Use this handy coupon for further information

CINCINNATI CLEANING & FINISHING MACHINERY CO., INC.
2004 HAGEMAN STREET, SHARONVILLE, OHIO

☐ *Tell us how a Cincinnati engineer can point out time and labor savings and production increases in our cleaning.*
☐ *Have your representative call.*

Name_____

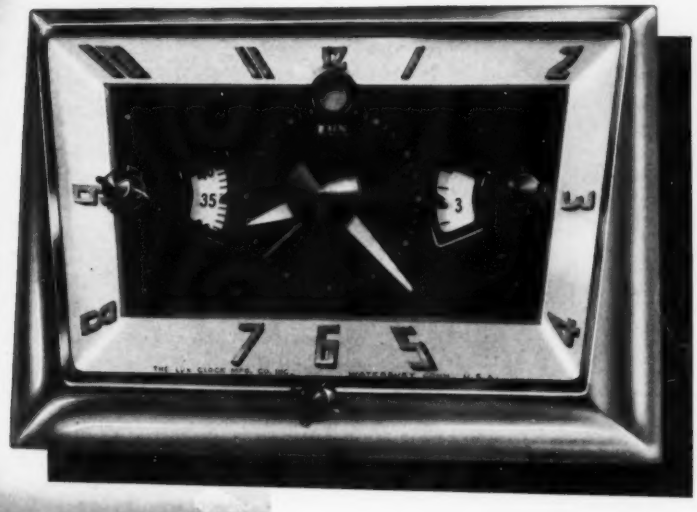
Company_____

Address_____

City_____ Zone____ State_____

Cincinnati
CLEANING & FINISHING MACHINERY CO., INC.
2004 HAGEMAN STREET, SHARONVILLE, OHIO

Advanced Design Lux Range Timer runs on LUBE-LESS Bearings



The amazing LUX fully automatic range timer with improved synchronous motor has long wearing motor bearings that need *no lubrication*. Absence of lubricants virtually eliminates heat-formed gummy residues — primary cause of timer failure.

Lube-less bearings are just one of many features that make the new LUX Range Timer tops in long-life dependability . . . tops for adding sales appeal to your ranges.

- SMART NEW DESIGN WITH *SNAP-IN MOUNT* SAVES ASSEMBLY TIME. NO STUDS OR RINGS NEEDED. EASIEST INSTALLATION AVAILABLE.
- THREE-WAY COOKING CONTROL — AUTOMATIC, SEMI-AUTOMATIC AND EXCLUSIVE BELL-CHIME MINUTE MINDER. NO PUSHING, NO PULLING . . . KNOBS CAN BE SET IN EITHER DIRECTION . . . IN ANY ORDER.

  AUTOMATIC: Simple as "A, B". A — set "time-to-start" hand (bottom knob). B — set "hours-to-cook" (right knob). Oven turns on and off automatically.

  SEMI-AUTOMATIC: Merely set "hours-to-cook" knob. Oven turns on immediately, off automatically. This single knob setting is a feature *exclusive with LUX.*
- WHILE OVEN IS BEING TIMED AUTOMATICALLY, MINUTE MINDER (LEFT KNOB) IS ALWAYS AVAILABLE AS A BELL REMINDER FOR TOP BURNER COOKING.
- HANDSOMELY MODERN 3 DIMENSIONAL STYLING ADDS LUXURIOUS EYE-APPEAL TO YOUR RANGES.

Construction details on the synchronous motor of this new fully automatic Lux range timer haven't yet been released. But you can have a personal preview of the superior design features it incorporates. Write, wire or phone stating when you'd like your LUX representative to call.

DEPARTMENT F

THE LUX CLOCK MFG. CO., INC.

WATERBURY 20, CONNECTICUT

SELL more... SAVE more... with PYRAMID rolled shelf trim

Here are a few variations of shelf edgings roll formed by Pyramid—in stainless steel—cold rolled and aluminum. No. (1) Smooth contour channel (2) Attractive rippled design (3) Smart vertically ribbed pattern (4) New beveled face serves as edging and pull handle.

Shelf edge mouldings add appeal at point of sale . . . and many of PYRAMID'S standard sections can be inexpensively modified — or custom shaped into *sales making trim.*

Write for your free "Plan Book of Metal Mouldings", today!

Pyramid Mouldings Inc.

5365 WEST ARMSTRONG AVE., CHICAGO 30, ILL.
NEW YORK...CALIFORNIA

SEND FOR YOUR FREE COPY OF "PLAN BOOK OF METAL MOULDINGS"

No one connected with the design or manufacture of any appliance should be without a copy of this book containing hundreds of standard and special mouldings. Send for your free copy today.

Without obligation, please send copy of "Plan Book of Metal Mouldings." F-10

Name_____ Title_____

Firm_____

Address_____

MEETINGS

LUBRICATION CONFERENCE

Joint Lubrication Conference of American Society of Lubrication Engineers and the American Society of Mechanical Engineers, Antlers Hotel, Indianapolis, October 10-12.

GAS APPLIANCE MFRS. MEETING

Gas Appliance Manufacturers Association, annual meeting El Mirador Hotel, Palm Springs, California, October 12-14.

AWS FALL MEETING

American Welding Society, National Fall Meeting, Bellevue-Stratford Hotel, Philadelphia, October 17-21.

AGA CONVENTION

American Gas Association, Annual Convention, Los Angeles, October 17-19.

PEI ANNUAL MEETING

Porcelain Enamel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., October 26-28.

PACKAGING INST. FORUM

Packaging Institute, 17th Annual Forum, Hotel Statler, New York City, October 31-November 2.

AHLMA NAT'L. CONFERENCE

American Home Laundry Manufacturers' Association, 9th National Home Laundry Conference, Sheraton-Palace Hotel, San Francisco, November 2-3.

TIME AND MOTION STUDY

Industrial Management Society, 19th Annual Time and Motion Study and Management Clinic, Sherman Hotel, Chicago, November 9-11.

AIR-CONDITIONING SHOW

Ninth exposition of the air conditioning and refrigeration industry, Auditorium, Atlantic City, N. J., November 28-December 1.

Try Century Vit

TITANIUM WHITE

1. COLOR STABILITY
2. HIGH REFLECTANCE
3. HIGH OPACITY
4. GLOSS
5. TEXTURE
6. WORKABILITY

With Century Vit Titanium cover coat over Century Vit ground coat enamel you have an unbeatable combination for adding beauty and durability to your appliance or other metal product.

Century frits are *time proved* in production plants before they are sold to you. The titanium frits give you the six characteristics: color stability, high reflectance, high opacity, gloss, texture and workability, so important to your plant and finished product.

Then too — you will save money 1) in frit cost and 2) on the production line.

A Century field engineer can show you how to improve your product and save money too if you will let us hear from you now.

FRIT from CENTURY FRIT MASTERS

CENTURY VITREOUS ENAMEL COMPANY

• 6641-61 S. Narragansett Ave., Chicago 38, Ill. •

PAINT MILEAGE JUMPS

from 370 to over 600 square feet per gallon with

RANSBURG NO. 2 PROCESS

When General Water Heater Corp., in Burbank, Calif., switched from hand spray to Ransburg No. 2 Process in painting water heater jackets, paint mileage increased almost 65%. Where General formerly got 370 square feet per gallon of paint, they now get over 610 per gallon.

On this installation, units ranging from 20 to 100-gallon size are painted with Ransburg No. 2 Process reciprocating disc atomizer. Changes in jacket sizes can be made without stopping the conveyor. With the reciprocating disc atomizer, change in stroke length is made "on the fly" without shutting down production. General also paints smaller parts, such as heater tops, bottoms, doors and legs, with the Ransburg equipment.

In addition to paint and labor savings, General Water Heater is getting "excellent consistency" and a high quality finish on their products. Another on-the-job-example of the unmatched efficiencies of the Ransburg No. 2 Process of electrostatic spray painting!

Ransburg maintains complete laboratory facilities for test-painting YOUR products under simulated production conditions. Why not let us show you what Ransburg Electrostatic Processes can do for you in YOUR finishing department. No obligation.

Ransburg ELECTRO-COATING CORP.

Indianapolis 7, Indiana

RANSBURG

MEET "LITTLE STEVE," A NEW, SPACE SAVING, LOW COST AUTOMATIC PLATING AND IMMERSION PROCESSING MACHINE

Here's What "Little Steve" Can Do

ELECTROPLATING
ANODIZING
BLACK JAPANNING
ENAMELING
ELECTROTYPE PLATING
PLASTIC COATINGS
HARD CHROME PLATING
PHOSPHATE COATINGS

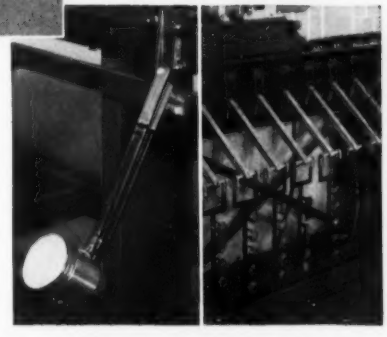
UP TO 40,000 PIECES PER DAY
540 RACKS PER HOUR

Yes, this new immersion processing machine by Stevens can process up to 40,000 pieces per day – and it has a variety of other uses too.

Ruggedly built "LITTLE STEVE," the hit of the 4th Industrial Finishing Exposition, can be obtained at a surprisingly low initial cost. It is ideal for large or small companies for it will fit many production cycles. It uses an arm as a rack or will take racks for small parts.

Being of small size it offers no floor space or load problems; involves low solution expense and means a small capital investment. It can be used easily as a laboratory testing machine.

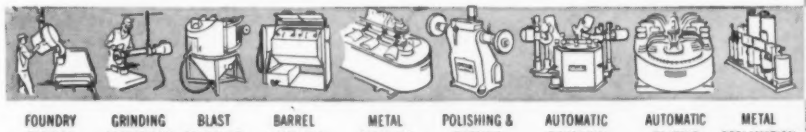
For further information about "LITTLE STEVE" write for illustrated folder or call your local Stevens sales engineer.



A single part can be placed on each carrier arm as shown in the illustration above or racks of numerous parts can be used.

If a larger production model is desired the "Sgt. Steve" unit, using the same basic design, will provide the answer.

BRANCHES: BUFFALO • CLEVELAND • INDIANAPOLIS • NEW HAVEN



FOUNDRY FACINGS | GRINDING OPERATIONS | BLAST FINISHING | BARREL TUMBLING | METAL CLEANING | POLISHING & BUFFING | AUTOMATIC FINISHING | AUTOMATIC PLATING | METAL RECLAMATION

Metal Finishing equipment and supplies from castings or stampings to finished product.

FREDERIC B.
STEVENS
INCORPORATED
YOUR METAL FINISHING SUPERMARKET
DETROIT 16, MICHIGAN

How Federal Helps Whirlpool

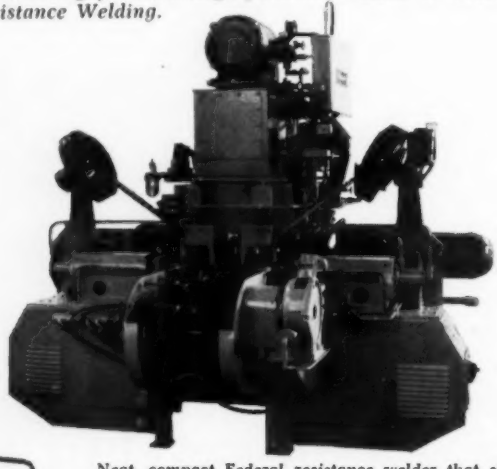
BUILD BETTER HOME LAUNDRIES

Mills, Welds, Tests 1,000 Washer Parts per Hour!

A special resistance welder designed by Federal is helping Whirlpool build better home laundries, faster at reduced costs.

It is believed to be the first machine to combine a milling operation with resistance welding. It also assembles three parts and performs a 100% test — completing 1000 finished assemblies per hour with one operator.

The assembly is a tub suspension rod, and is comprised of a length of rod, a bracket and two metal discs. The operator fits the bracket over the rod and drops it into a hopper — the machine does the rest. It carries the rod to a milling station where the rod ends are machined to proper radius for best projection welding. The two discs are hopper fed to the ends of the rod at the welding station. After welding the parts are automatically transferred to a test station where each assembly is given a 3000 pound "pull test." This is another example of how Federal's "know how" in resistance welding is paying dividends to one of America's leading manufacturers. Next time you're considering your welding operation — think of *Federal — First in Resistance Welding.*



Neat, compact Federal resistance welder that speeds production of tub suspension rods for Whirlpool.

Federal® WELDERS

Warco® PRESSES

The Federal Machine and Welder Company
WARREN, OHIO

7 billion dollar gravy train

Gentlemen:

I read with interest your editorial in the August, 1955, issue of *finish* regarding "A Seven Billion Dollar Gravy Train". I would like to present the Hoover Commission report to both our local Junior Chamber of Commerce as well as our state organization for their endorsement. However, in order to do this I must necessarily develop supporting data.

I have hopes that in view of your August editorial you are in a position to provide me the necessary information for presenting this to an organization such as the Junior Chamber of Commerce for our endorsement.

S. C. Scheller
Buyer
Universal-Rundle Corp.
New Castle, Penna.

---

special home laundry section

Gentlemen:

I have just finished looking through the September, 1955, *finish* and am delighted with the attention the home laundry industry has received, not only in the special section but also in the Hotpoint article and the trade association comments by our general counsel, George Lamb.

Guenther Baumgart
Executive Director
AHLMA
Chicago, Illinois

Gentlemen:

Congratulations on your fine special section devoted to the Home Laundry Industry! It certainly is the finest you have put together to date.

John R. McCord
Manager — Ceramic Sales
Ferro Corporation
Cleveland, Ohio

Gentlemen:

I appreciate your forwarding me the special section on the home laundry equipment industry from the September issue of *finish*.

The entire section is very well done and the Association is indeed indebted to you for your interest and efforts in promoting the good work which is being carried on.

W. H. Reeve
President
AHLMA
Chicago, Illinois

more letters on Page 104 →

THE finish spotlight

This Carrier room air conditioner, the "Roomette", which sits on the floor instead of a window-sill, need not be located anywhere near a window. It measures 27" high, 15" wide and 28" deep. Air for refrigerant condensing is drawn through the bottom of the unit.

Processing small metal products at low unit cost

fabricating, polishing, plating and painting kitchen accessories, cabinet hardware, rolling door hardware and architectural products

by Howard E. Jackson

finish

The products of Washington Steel Products, Inc., of Tacoma, Washington, consist of two trade marked lines. The *Kitch'n Handy* line includes automatic pop-up garbage containers, disappearing pot holders, spice shelves, package shelves, tuckaway shelves, knife holders and all sorts of holders for utensils, for soaps and cleaners, for glasses, lids, paper towels and waxed paper. Also, towel bars and disappearing towel dryers.

The *Washington* line consists of three main divisions: architectural products, cabinet hardware and rolling door hardware.

Architectural products include such items as metal food drawers for wood cabinets (the lid secures to the inside of the cabinet and forms the permanent runners for the drawer), metal and wire fruit and vegetable storage bins, metal drawer units, tin drawer liners, flour sifters and sugar dispensers, shelf guides, rolling drawer slides, revolving corner shelves, "Lazy Susan" hardware, fully adjustable mixer shelf hardware and other items. Many of these items are painted white or aluminum.

Cabinet hardware includes solid die cast, concave face Spotlite knobs, knob and plate combinations (Mirroknobs), Mirropulls, "Comfort Grip" pulls for every size door or drawer, friction catches, metal louvers, semi-concealed hinges, pin hinges for flush doors, and other items. Finishes include polished chrome, dull chrome, polished brass, dull brass, polished copper, dull bronze or prime coat.

The rolling door hardware is complete with "V" grooved track with full bearing area, hangers, guides, finger pulls, track locks and the like.

This display shows some of the items of "The Washington Line."

Automatic and semi-automatic fabricating equipment employed

Fabrication in the 120,000 square foot factory is the first important step in production. The latest type punch presses, power brakes and shears are employed. Many of the machines have semi-automatic or automatic set ups . . . with coil reels, progressive dies, etc. The machines are equipped with air ejection for speed and safety. Runs of 10,000 parts are common.

In a number of instances an operator and a helper are used together on the punch presses. In the production of mixer shelf hardware two women are used at the 4-ton equipment. One installs clips, checks riveted parts, places parts in boxes and keeps the work table clean. The operator can concentrate on riveting the lever arms to the brackets (four rivet operations).

In making drawer bodies shearing is done on either of two 10-foot

A large press brake and four punch presses working under normal conditions.

shears. Sheared material is taken by fork lift truck to side by side press brakes. The sides are formed up on a 4-foot brake. One man assembles the sides, the second seals the ends in a press brake (six hits) and the third puts on final assembly finishing touches. The next machine, another 4-foot press brake, forms and pierces the drawer slides, bending both sides and piercing four holes simultaneously . . . in a shop-made, unusual die that cuts the flat sheet ends, forms and folds them under and punches the holes.

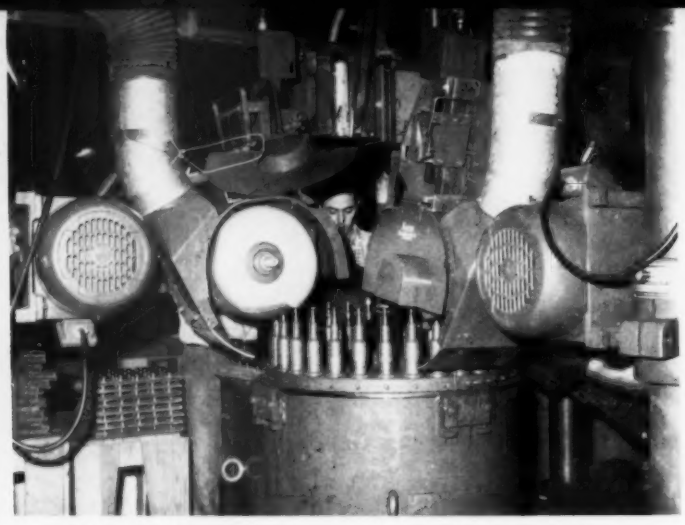
Much tooling follows conventional set ups, but the most is made of the conventional. Using a punch press with Whistler dies is an example. One man on one side of the machine punches in mounting holes, and a second man on the other side of the machine countersinks inside and outside holes in drawer slides.

There are many unusual miscellaneous set ups. Aluminum extrusion, for drawer pulls, is cut off into $\frac{5}{8}$ inch wide sections on a home-made swing saw cut-off machine. Semi-automatic in operation the saw is actuated by an air motor as the bar, manually fed, comes against a gage stop. Rollers hold the extrusion down on a guide rail which also insures squareness of the cut. The saw itself is guarded to prevent injury.

Air motors are used to good advantage wherever possible. A semi-automatic dial table drilling machine (drill and tap) was made incorporating bench drills and air motors. The design provided automatic clamping and unclamping of work-holding fixtures with manual loading of the workpieces.

As an example of sequence in the production of hinges, the 16 gage steel coil stock feeds from the reel to the straightener, to the automatic feed on one side of a dieing machine, to the die for blanking (three holes, countersink and two ears) in the dieing machine, to a small shear on the other side of the machine for cutting off excess material. The hinges, stamped out at the rate of 240 a minute, go down through the machine and out into a metal chute where they are neatly held standing on edge. All the machine operator

This semi-automatic saw, actuated by air power, cuts aluminum extrusions for draw pulls. Rollers hold the extrusions down on a guide rail to insure squareness of cut.



Polishing die cast knobs on a three-head rotary polisher.

Loading and unloading die cast handles from straight-line unit.

needs to do is set the die and roll feed.

Since the dieing machine is automatic, the operator is free to feed the blanked out parts to the punch press located within arm's reach of the metal stacking chute on the out end of the dieing machine. The operator merely removes a handful of stamped hinges from the chute and feeds them to an open throat metal chute on the punch press. The stamped hinges drop into a slot, arms feed them to the progressive die, the offset, and two barrels for the rivets are bent over, and the formed hinge comes out a third chute at the bottom of the press. The trip on the press is set so that the machine works automatically.

Polishing, plating and painting

The polishing area is adjacent to the plating area. One paint line is run in connection with plating and is located next to plating. A second paint line paints non-plated items in an area next to the fab shop. Let's take a look at each area.

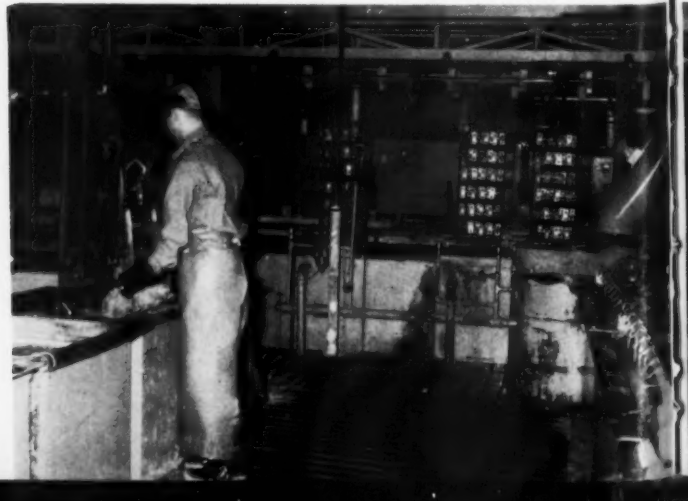
Polishing of die cast knobs is done on a three head automatic rotary polisher . . . 30 parts on the machine at all times. The undersurface and top are done simultaneously. Two operators are used. One loads; the other unloads. Between 1500 and 2000 medium sized knobs can be polished per hour. Some 40 types of buffs are used (up to 16 inches) . . . depending on the metal and the concave of the knob. The compound is automatically bar fed to the polishing wheels. This machine has an exceptionally good blower system with a cyclone on the roof and then a down duct to the waste barrel.

Die cast handles are polished in a 25-foot long straight line polishing set up. The set up includes an oval endless conveyor, with one burring head and two 15 hp buff motors for one side handle polishing and a similar one-burr, two-buff arrangement on the opposite side of the table for polishing the other side of the handles. Two operators are used. The first loads the handles onto special platens (different sizes for different handles) fixed to the conveyor. The first machine burrs the edges, the next two buff the one side. The parts make the U-turn, and the burring and buffing is done on the reverse side. The second operator removes the polished handles. Double applicators are used on the buffing machines . . . an 8-inch wide cut and a 6-inch wide color. Some 2000 handles are polished an hour . . . and no less than 10,000 pieces are run off at one time. This line too has the same kind of blower system.

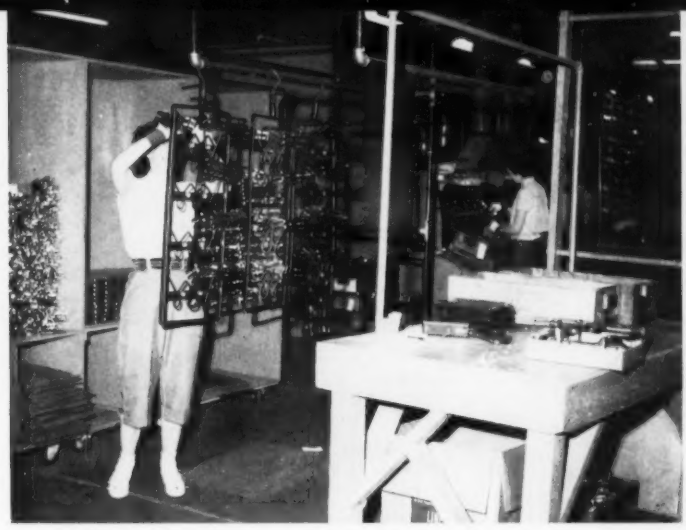
A battery of six hand-polishing

Left: Removing rack full of plated parts from the main plating lin

Below: The aluminum and zinc-preplate lines terminate here at righ angles to the main plating line in the Washington Steel Products plan



Hinges and other parts are deburred in these burnishing barrels.



A section of rack-up area in the plant's main plating section.

lathes with variable speed and double motors is used to satin finish and bright finish brass, copper and bronze. Edges are first deburred in a grinder, then the tops polished. The three machines are back to back with the other three machines and have a common blower duct system between them. Between 3000 and 4000 satin knobs are polished per day.

In this same room, set off behind separate partitions, are two polishing machines used strictly for experimental work. One is a rotary type machine with six heads, with six jacks for liquid compound; the other is a rotary and index, three-head machine. The company is working on jigs and fixtures that will hold the pieces to be polished on a conveyor type system so that polishing will be automatic. This will further improve quality and increase production. (Up to now 30 different wooden jigs have been used to hold the pieces to be polished . . . hand held and fed to the lathes.)

Hinges and some aluminum pulls that require a high polish prior to plating are deburred in one of two large finishing burnishing barrels. Each barrel has two compartments which can hold 700 parts. About 2800 parts are deburred in a 4-12 hour period.

The short barrel line is located between the burnishing barrels and the main plating section. Here all purchased screws, and hangers made in the fab shop for rolling door hardware, are cadmium plated. The steps (side by side tanks down and around the oval line) are cleaner, water rinse, hydrochloric acid pickle 30 per cent solution, rinse, cyanide holding tank. The parts which are in a barrel and moved from tank to tank by a lift on an endless oval track are dumped into the last tank on the one side of the line. They are then put into one of two barrels and lowered into the cad-plate tank for the required time (20-30 minutes) in the first tank on the opposite side of the line. They then go to a cleaning tank (copper rinse some parts) then rinse and centrifugal dry. About 3000 pounds are cad-plated in a day. The parts are then ready for assembly and packaging or returned to stock. This barrel line has its own blower system, with openings to the ducts at a level with the tanks.

Plating department

In the main plating area behind the polishing, barrel line section, rack ups are made across the front. Die cast and aluminum pulls are placed on double-prong metal racks. Steel parts are racked in the next four

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Right: Principal water-wash spray booth with automatic conveyor system.

Below: Brass, bronze and copper finished parts leave overhead oven (upper left), make U-turn on conveyor and are unloaded near packaging tables.

I Nearly Blew My Top!

"The other day the Detrex man pointed out to me that metal cleaning and surface preparation accounts for ¼ to ⅓ of all the operations in the average metal-working plant. It sure caught me by surprise and, frankly, it started me thinking about our own plant. After a complete survey we found over ¼ of all our operations were of that type.

"What was immediately apparent to me was how important even the smallest single savings would become when multiplied by the number of operations involved. It certainly changed my way of thinking on the importance of metal cleaning and surface preparation. When I think of how little regard we had been giving those operations, *I nearly blew my top.*

"Take, for example, our metal parts washing operations. By switching to Detrex cleaners we were able to effect savings of a size we never before thought possible. One of the things that really impressed us about Detrex Emulsions was the fact that they not only do an excellent job of cleaning but they also retard rust . . . and all in one operation. That alone saved us considerable money.

"Why don't you let the Detrex man in your area make the same type of survey in your plant? It isn't going to cost you a penny if he doesn't show you how you can save money. If he does, you'll probably buy some chemicals and/or equipment, but more important you'll be saving big dollars. You have nothing to lose and everything to gain. Why not give him a crack at it next time he calls?"

**Detrex alkaline and emulsion cleaners have reduced manufacturing costs in hundreds of plants. They provide better and more positive cleaning action . . . faster and at lower cost.*

Service with a Saving!

DETREX CORP.

Dept. 407 • Box 501, Detroit 32, Mich.

DEGREASERS • DEGREASING SOLVENTS • WASHERS
ALKALI & EMULSION CLEANERS • DRYCLEANING
EQUIPMENT • PHOSPHATE COATING PROCESSES

It's easy to remove weld discoloration from stainless steel

by W. E. McFee • SUPERVISOR, PRODUCT INFORMATION SERVICE, ARMCO STEEL CORPORATION

DURING the welding of stainless steel, heat discolors areas adjacent to the weld. How to get rid of this discoloration, especially in hard-to-reach inside corners where mechanical methods would be costly, is the subject of this brief article.

Research came up with the answer: an electrolytic process using alternating current. You connect one terminal from an a-c power source to the work, the other terminal to a suitable electrode. Then you pour enough electrolyte into the welded corner to cover the discolored area. The electrode should be in contact with the electrolyte but not touching the work surface. Where the electrolyte can not be contained, as on outside corners, wrap the electrode in cloth and soak with electrolyte.

What electrolyte to use

The most practical electrolyte is a 50% (by volume) solution of commercial (75%) phosphoric acid in water. It gives off no odor, doesn't fume, and produces uniform color of the cleaned area. Higher concentrations will produce a bright surface but take more time. Lower concentrations produce a dull surface. If it is important to your work, the concentration may be adjusted to match the cleaned areas with the original surface.

Use no more electrolyte than is necessary to cover the discolored parts. Rinse thoroughly with water after the discoloration is gone.

A general-work electrode

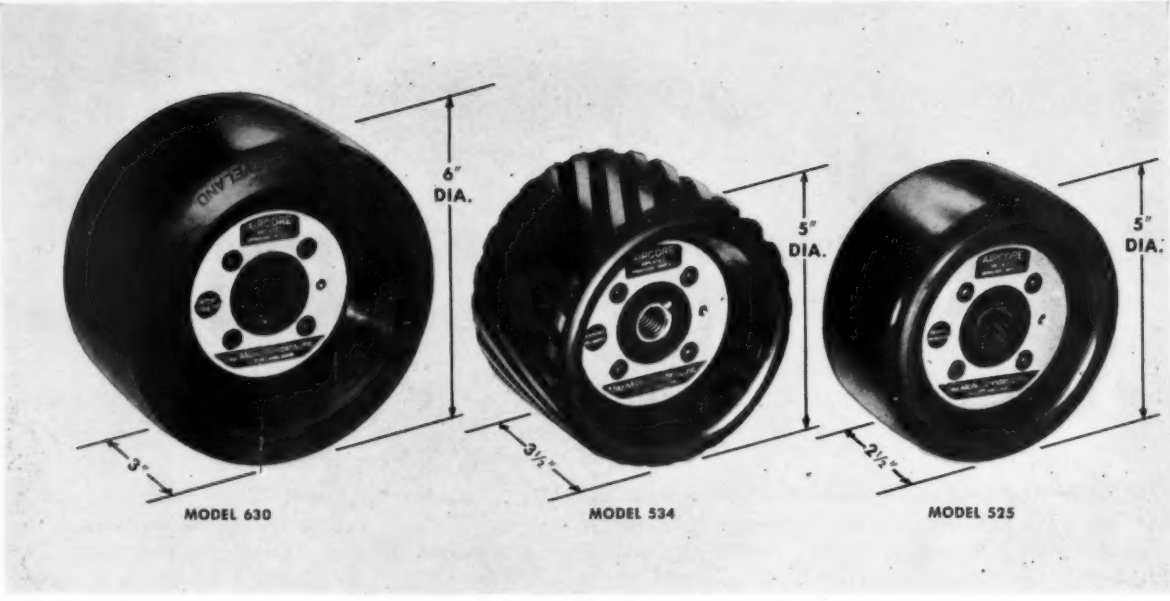
Take an 8-inch length of 1/4" round copper. Bend 1" to 2" 90 degrees at one end and 45 degrees at the other end. Use whichever end is most effective in applying the electrode to the work. To insure positive electrical separation from the work, the working area at each end is protected by two rubber bands or small sections of rubber tubing. Special electrode shapes may be used for special applications, but the principle remains the same.

When proper connections have been made, as described earlier, place the electrode in the electrolyte and let the rubber insulators contact the work. Cleaning action starts when the electrical circuit is completed through the electrolyte. Rub working area of the electrode gently over the

to Page 46 →

Right: Handy electrode for general work formed from a copper rod.

Below: Removing weld discoloration from inside corner.



Interchangeable Aircore Grinding Wheels now available in three sizes

Shown above are three Aircore Inflated Grinding Wheels that feature interchangeable contact drums. All three models are available with plain or serrated contact faces and can be used with all standard drive methods.

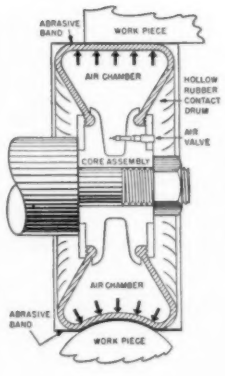
The core assembly is identical for all three models. Complete change-over from one size contact drum to another size takes less than five minutes.

The extremely light weight of these models helps reduce operator fatigue. The Model 534 weighs only 15 ounces.

A gradual "feather" blend instead of a hard edge cut is produced by Aircore's new sidewall and rounded edge construction.

Any durometer hardness can be duplicated simply by varying air pressure in the air chamber.

All the facts about Aircore Grinding Wheels are yours for the asking. Write today for Aircore Bulletin No. 9.

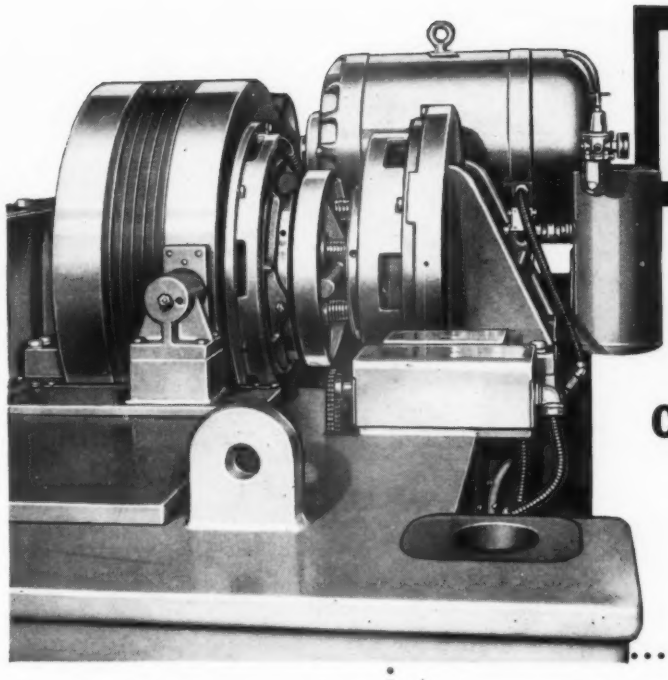


The Nu-Matic Air-Inflated Grinding Wheel is built like an auto tire — flattens out at point of contact — contours to work surface.

Here you see the large grinding area that an Aircore gives on flat surfaces. A sheet of glass is pushed against an Aircore wheel that has been inflated to 3 pounds pressure.

NU-MATIC GRINDERS, INC.

8224 Carnegie Ave. Cleveland 3, Ohio



These are the features **that make Verson presses your best buy**

THE Verson CLUTCH AND BRAKE UNIT

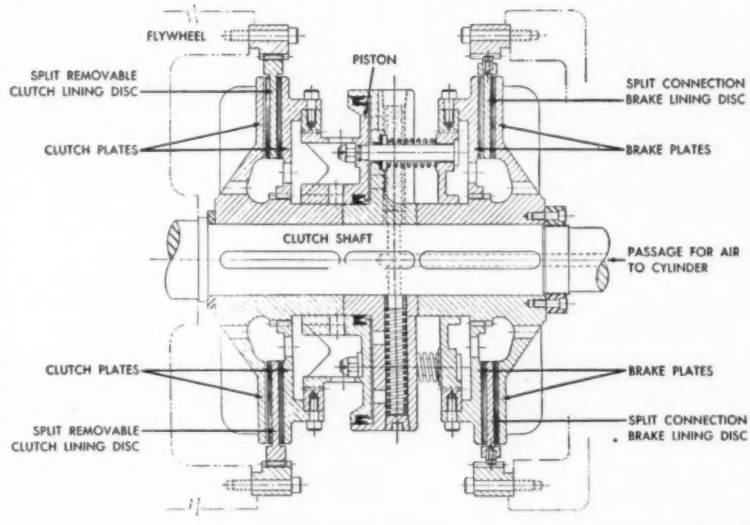
No tricks— just top notch performance

The drawing at the right shows the construction and operation of the Verson clutch and brake unit.

With the clutch disengaged, powerful brake springs clamp brake plates against the stationary brake disc. The brake disc is mounted to the press frame in a manner that will permit axial motion but will oppose rotation.

To engage the clutch, air is admitted to the operating cylinder through a passage in the drive shaft. This forces the piston out, compressing the brake springs and releasing the brake. Further motion of the piston engages the clutch thereby transmitting the motion of the flywheel to the clutch shaft.

When air pressure in the operating cylinder is released, the brake springs pull the piston back, first disengaging the clutch and then engaging the brake.



The Verson Pneumatic Clutch and Brake Unit is the heart of Verson mechanical presses. It is a mechanically interlocked type which eliminates all possibility of overlap between clutch and brake. Drag cannot occur, efficient power application is assured and wear on clutch and brake linings is minimized. Shock and vibration are also minimized for longer press life. This is no trick clutch . . . it is a soundly designed unit that has been proved in countless hours of abusive tests and years of field experience.

The Verson Pneumatic Clutch and Brake Unit is just one of many reasons why it pays to specify Verson Presses for your requirements. We'll be happy to tell you the whole story. For specific recommendations, send an outline of your requirements.

Ask us about our new customized installment and leasing programs.

A Verson Press for every job from 60 tons up.

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From exit end of 175-foot pickling machine inner dryer cabinets and washer exteriors are being transferred to conveyor at left leading to ground coat dipping area.

Finishing home laundry equipment at Hotpoint

world's largest spray pickling machine, three level mill room and materials handling methods are features of porcelain enameling department.

Part II of a series

THE new home laundry manufacturing facility of Hotpoint Company, Chicago, has nearly 8 miles of conveyors which speed the handling of parts within and between individual production departments, including the porcelain enameling department which is almost completely conveyorized.

All washer and dryer parts to be porcelain enameled are delivered from the fabrication department on an overhead monorail which is equipped with rack hangers on which two or more parts can be nested.

As this conveyor passes the entrance to an elevated, 175-foot, tunnel-shaped pickling machine, the ware is transferred manually onto the machine's endless conveyor made of rubber-covered stainless steel cables which move the parts through 11 separate operations.

As the parts move through the machine (said to be the largest of its type in the world), a hot alkaline jet spray first removes loose foreign material clinging to the surface of the metal. A sulphuric acid spray then removes rust and scale and etches the

metal surface, followed by a deposit of nickel. Sandwiched between these operations are hot and cold rinses. The final operation is a spray of alkaline neutralizer.

Dipping 100 cabinets per hour at a single station

At the exit end of the pickling machine, the ware is manually transferred to a power belt conveyor feeding the ground coat dipping area which has two stainless-steel, water-jacketed, dip tanks — one on each side of the conveyor. The tanks are 7 feet deep and 7 feet square. A three-man team at each station can handle up to 100 cabinets or other major parts per hour per station.

In the cabinet dipping operation one person mounts a specially-designed hook on each cabinet as it approaches the dip area. The second man picks the part up with the aid of a push-button hoist running along a rail, one end of which moves in a small arc to permit the second person to dip the ware and swing it onto another conveyor. As the ware passes over the drain area, the third person performs a cupping operation whereby enamel slip is flowed onto exterior surfaces to smooth out drain marks. An open-end spray gun is used in this operation.

The ground coat dip tanks are equipped with a recirculating pump to provide constant agitation of the enamel slip. Nearby is a reservoir tank into which slip can be pumped and stored while the dip tanks are cleaned.

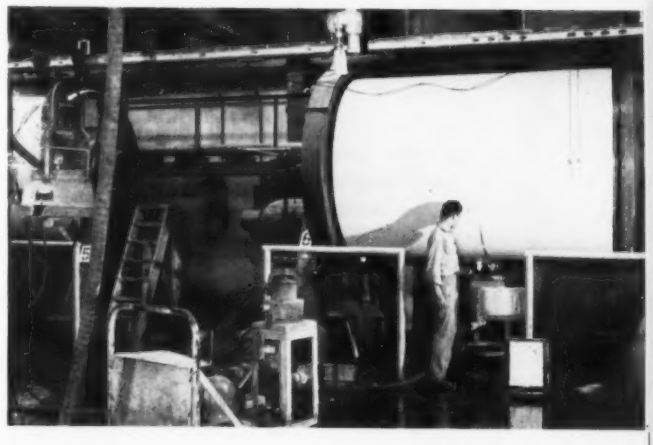
From the dip area the ware is carried up into an overhead oven where the ground coat is dried for 10 minutes at 300-400°F. The conveyor returns to floor level for a trip through one of four reinforcing spray booth set-ups, each consisting of twin 18-foot booths.

90% of overspray reclaimed by exhaust system

Each booth set-up has a 42-inch diameter stack which maintains an upward air velocity of 200 feet per minute. Overspray is drawn through three rows of staggered vertical baffles at the back of the booth. These stainless steel baffles break up the air

Stainless steel chutes above the mills feed frit and other raw materials from storage on top floor of three-floor mill section.

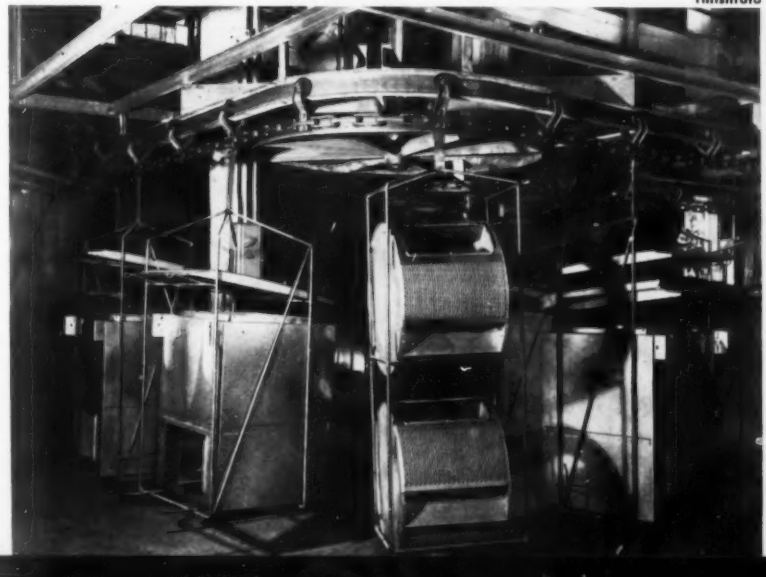
Air-conditioned storage room for enamel slip is located at second floor level above milling area.



Milled enamel being discharged into tank and pumped to air-conditioned storage room.

Method of loading special conveyor racks for in-plant transportation.

finishfoto



finishfotos

Left: This 7-foot-square ground coat dip tank is equipped with a recirculating pump to provide constant agitation of enamel slip. Note special device for handling parts through dipping operation and then re-hanging on dryer conveyor. — Right: Reaming holes prior to ground coat touch-up of recessed areas.

flow, and, since enamel slip is heavier than the air, overspray falls to the floor for easy reclamation. This system is said to eliminate over 90% of overspray from the air which is exhausted at the roof of the plant.

The ware is then carried up to a second dry-off oven for 5 minutes at 250-300°F. When the conveyor returns back to floor level, it passes five transfer stations where the ware can be loaded on the conveyor for the U-type electric furnace which is rated at 2250 kw.

From a pre-heating zone at floor level, the ground coat furnace chain rises into the firing zone which is elevated to minimize heat loss. The ground coat is fired at 1500-1550°F. at a conveyor speed of 20-30 feet per minute. The furnace chain then dips to a floor level cooling tunnel. At the exit, cool air is vented into the tunnel to keep excess heat from entering the work area. This heat is exhausted from the plant in the summer but is discharged into the conveyor penthouses during the winter months.

Next the ware is transferred to a pallet-type conveyor feeding the cover coat spray line. Following touch-up of the ground coat the ware enters a 32-foot pressurized spray booth where air contamination is minimized by the use of filters. The air first passes through oil filters then dry filters which are replaced periodically. The booth also has a water-wash reclamation system for enamel overspray.

The ware continues on the pallet conveyor through a U-type drying oven, followed by brushing and edging operations. It is then hung on the cover coat furnace chain and fired at 1500-1550°F. Following firing, the ware is transferred to the

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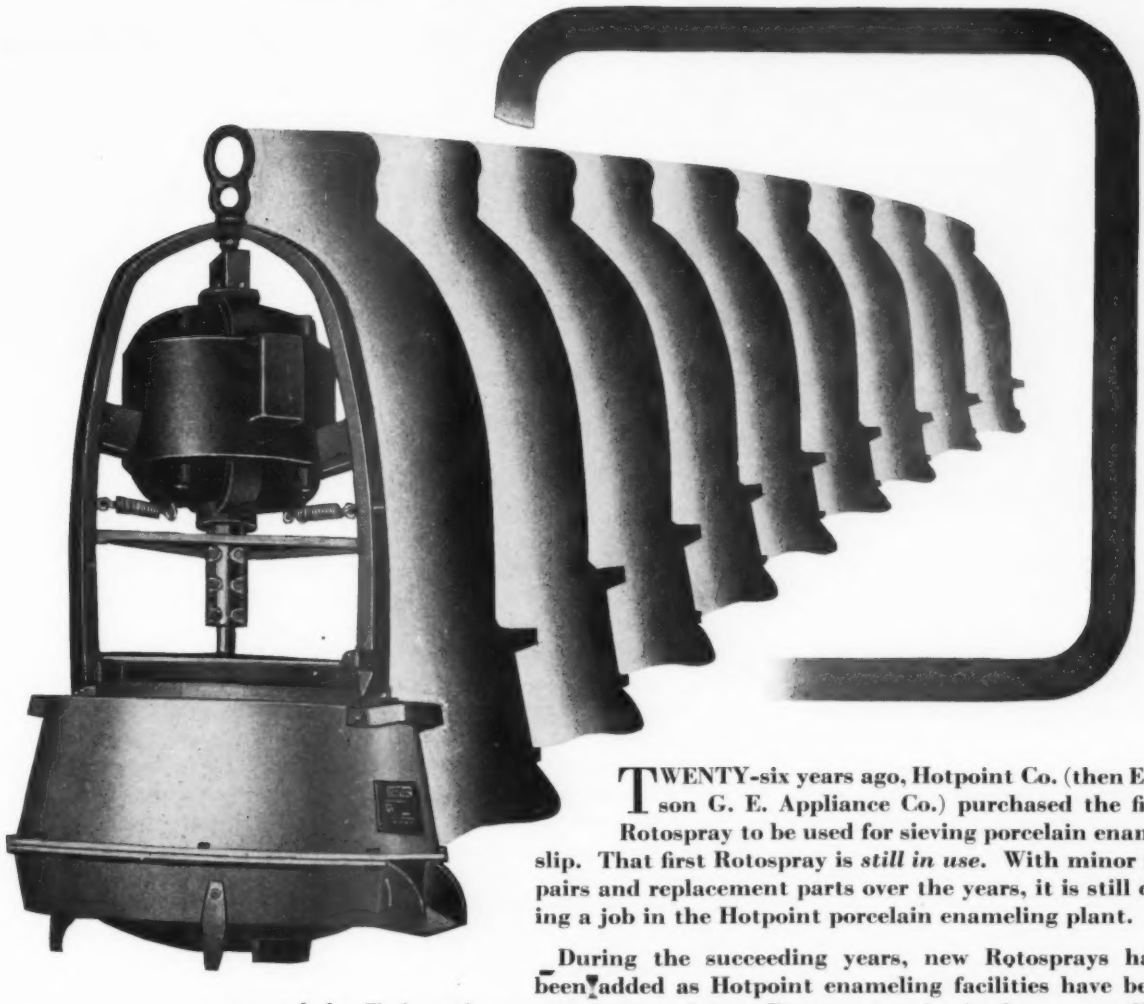
Left: Reinforcing spray booth has stainless steel baffles at back to break up the air flow and cause enamel overspray to fall to the floor for easy reclamation. — Right: View of U-type electric furnace. Firing zone is elevated to minimize heat loss. This ground coat furnace is rated at 2250 kw.

Sixteen Rotosprays at Hotpoint...

and the first one is still in use



TWENTY-six years ago, Hotpoint Co. (then Edison G. E. Appliance Co.) purchased the first Rotospray to be used for sieving porcelain enamel slip. That first Rotospray is *still in use*. With minor repairs and replacement parts over the years, it is still doing a job in the Hotpoint porcelain enameling plant.

During the succeeding years, new Rotosprays have been added as Hotpoint enameling facilities have been expanded. Today, the company uses sixteen Rotospray units in four enameling plants to keep enamel slip clean. Hotpoint appliance finishes must be first quality and Rotospray does the essential job of keeping them clean.

Like Hotpoint, other leading producers of home appliances consider Rotospray the Standard Method of sieving. Check your plant now and be sure it is properly equipped.

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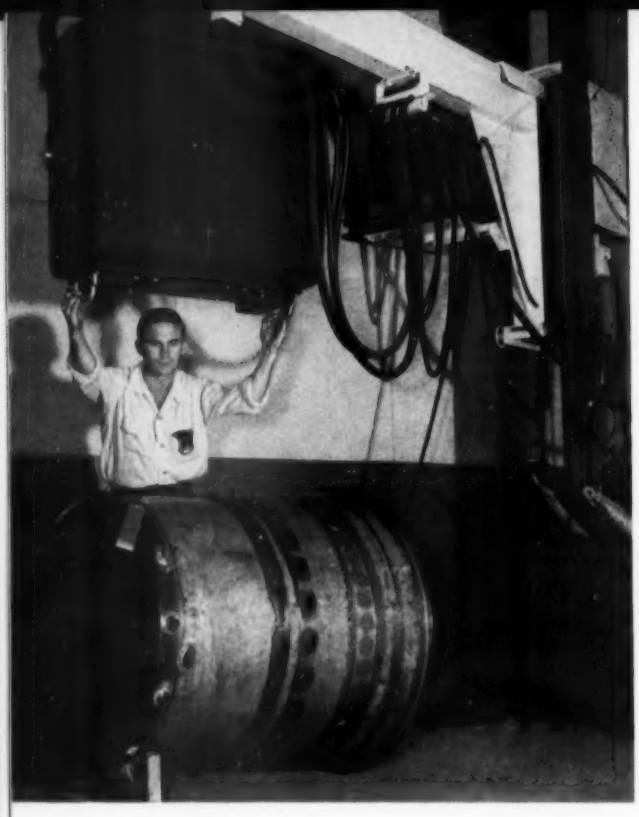

A 250,000 volt x-ray machine is positioned over a large jet engine casing by an x-ray technician. The machine will penetrate 4½ inches of stainless steel.

Inspection method

by A. S. Billings • MANA
QUALITY CONTROL, RYAN AERONAUTICAL

A GROUP of employees at Ryan fire electrons from cathode "guns", create magnetic fields and bathe metal in ultra violet radiation. Scientists in the laboratories? No, they are production line inspectors using advanced techniques to detect the slightest flaws in the metallic structure of components for jet engines, afterburners, rockets and ramjets.

The perfection of the microscope revealed a "new world" beyond the range of the human eye. With the microscope, "mountains" were discovered on the sharpened edges of razor blades, and the fine points of needles were found to be truncated cones. The microphone pioneered the science of metallurgy and helped to establish manufacturing on a precision basis. Today, precision components for jet engines and extremely delicate electronic guidance systems for missiles are built because of such earlier developments.

But, precision alone is not enough. Gleaming combustion chambers, seething afterburners and fiery rocket motors have to be as perfect internally as they are accurate dimensionally. To insure this structural soundness, Ryan inspectors must look beyond the clean, hard geometry of the metal surfaces and peer deep into the heart of the alloys themselves. To do this, the newest "eyes" of science are harnessed — "eyes" which can see far "beyond" the microscope.

X-ray examination

A striking tool of this type is the X-ray machine. Our facilities now include two complete X-ray installations capable of handling large volumes of work. X-ray wave lengths run from .05 to 2 Angstrom units. Because of this short wave length, X-rays can penetrate deep into solid matter which is opaque to light waves. X-ray technicians produce these waves with a Coolidge tube which bombards a metal target plate with a fast moving stream of electrons. As the swift electrons crash into the metal plate, their kinetic energy causes the metal to radiate streams of X-rays. These are focused and directed through the metal part to be examined. After passing through the part they impinge upon a photographic plate or film and affect its emulsion.

Left: A large J-65 jet engine component is magnetized by passing an electric current through it. If any surface defects are present, they will be detected by the magnetic particles which are attracted to the poles formed.

Below: One of the most valuable metallurgical instruments is the metallograph. This new $6000 model will help metallurgists peer into the microstructure of metals to observe the characteristics of their grain structures.

...r metallic parts

x-ray, fluorescent and dye penetrants, magnetic par-..., spectroscopy, and x-ray metallography can be used in production inspection and raw material checks

With the spectrograph, Wilson Hubbell, Ryan laboratory chief, takes a photograph of the light emitted by vaporized Inconel particles.

Some of the X-ray radiation is absorbed by the metal through which it passes, and this absorption is proportional to the density of the alloy. Consequently, all types of concealed discontinuities in the metal will show up as variations in the effects which the rays have upon the photographic emulsion. Hidden welding defects, such as gas pockets, cavities, porosity, shrinkage cracks and so on will appear as darkened areas of the film because they permit greater amounts of radiation to pass. Inclusions, such as slag, oxides, foreign material and other bodies may show up as darker or lighter areas depending upon the density of the surrounding metal.

By stepping up the power of the cathode "gun" which fires the electrons and thus releases the X-rays, it is possible to produce more powerful X-rays with greater penetrative properties. Ryan's largest machine employs a tube which has a maximum output of 250,000 volts at 10 milliamperes. With this power it is possiable to shoot X-ray photographs (radiographs) through four-and-a-half inches of steel.

Inspectors subject all fusion welds on such vital components as Pratt & Whitney Aircraft J-57 jet engines, Westinghouse J-46 afterburners and Boeing B-52 structural members to X-ray inspection. In addition, X-rays are used to search out the tiniest defects in a wide variety of castings, forgings, welded tank rings and other components whose soundness must be completely assured.

Fluorescent penetrant

Another technique employed to detect imperfections in metal parts is fluorescent penetrant inspection. This is a sensitive, non-destructive method for finding minute cracks, pores and discontinuities in all types of metal. In this respect it is more effective than X-ray inspection which will not disclose extremely small surface cracks.

In the procedure, the parts to be examined are coated with an oil-base, water-emulsifiable penetrant by dipping, brushing or spraying. The penetrant contains a mixture of fluorescent particles which will glow brilliantly under ultra violet light. The parts are allowed to stand for ap-

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Right: This system is used to subject jet engine parts to fluorescent penetrant inspection. Person at left sprays parts with fluorescent particles while the person at right prepares them for viewing in an ultra-violet booth.

Below: Clear as a fingerprint, a spectrogram tells the laboratory technician which elements are present in alloy tested in the Ryan laboratories.

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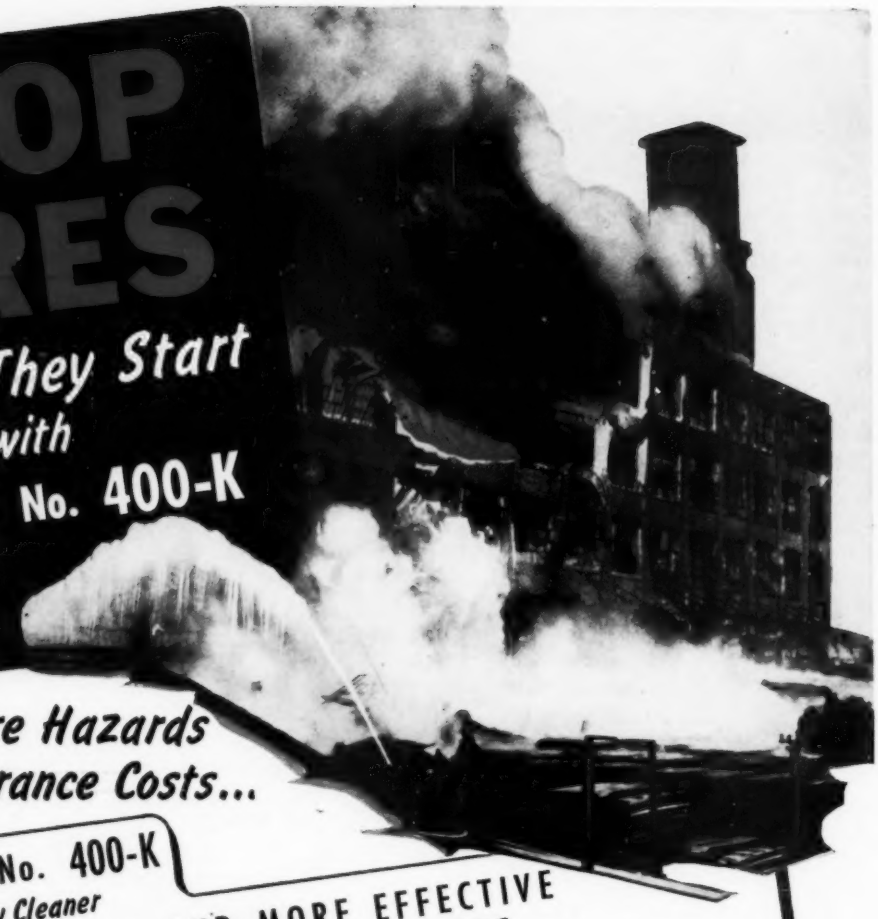

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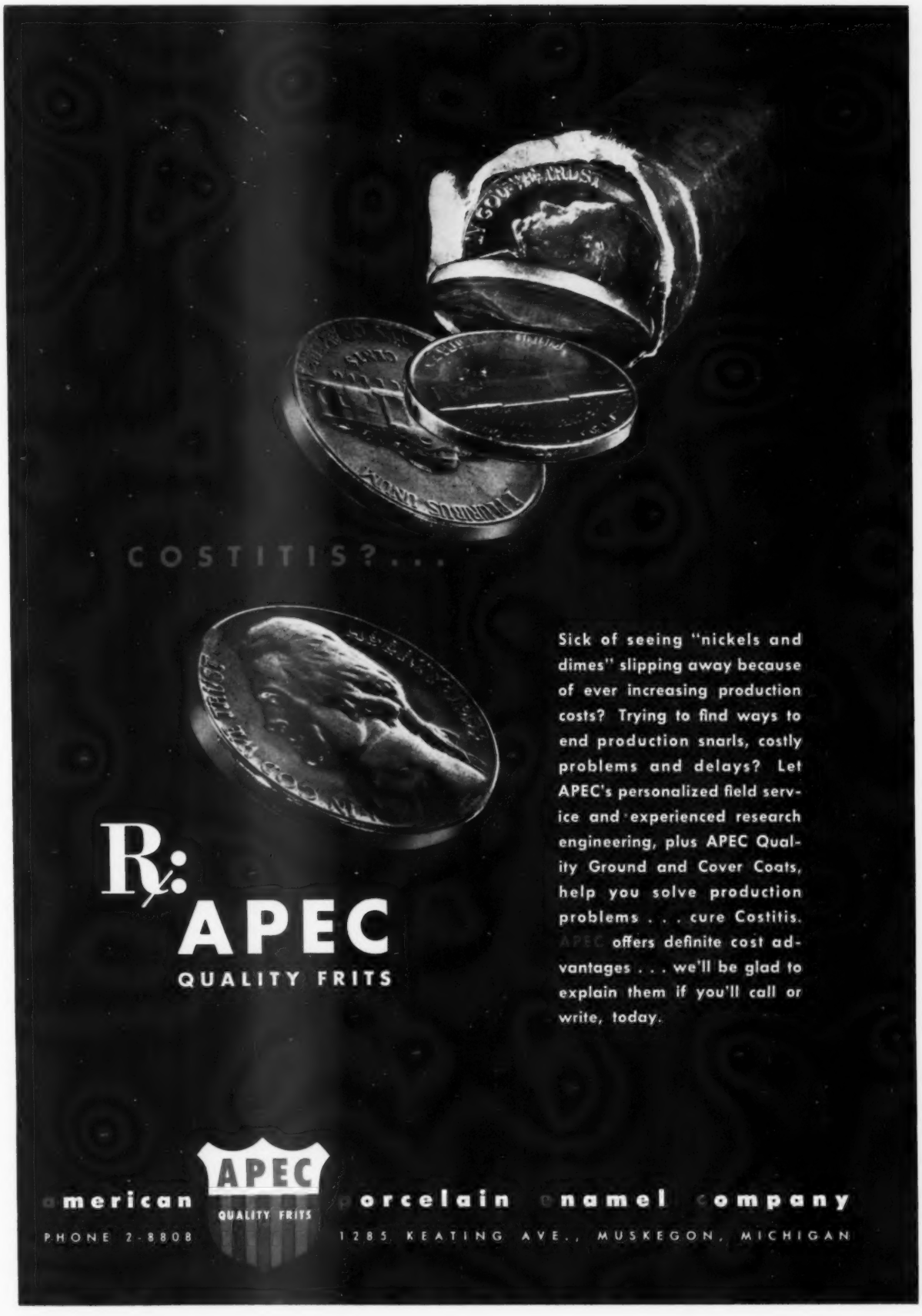
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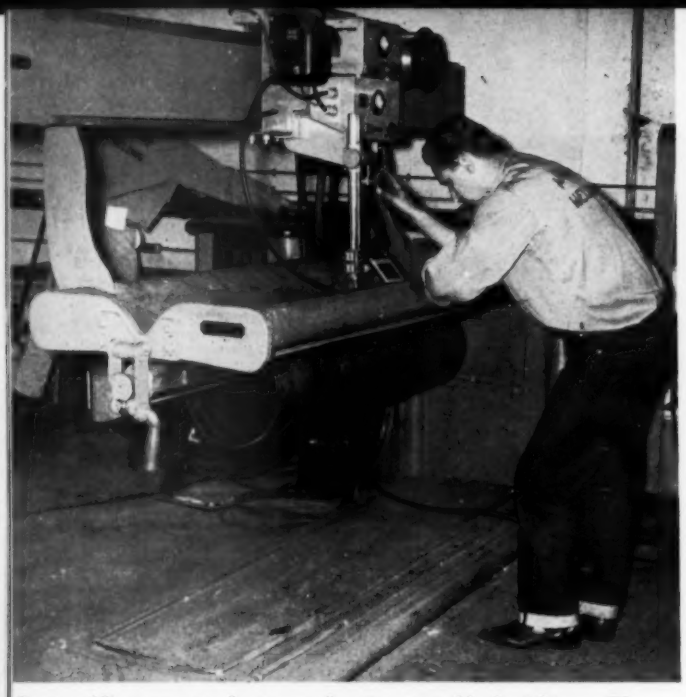
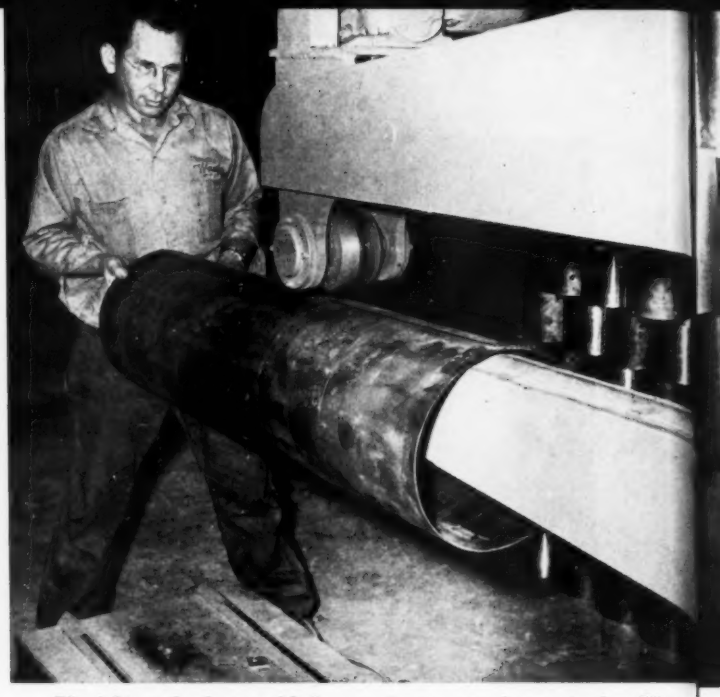


Butt welding a water heater tank prior to weld planishing. The planishing machine was actually developed as a sister-tool for this portable automatic butt welder.



Planishing the butt welded seam in a water heater tank. This is experimental work, so the tank was hand-guided during planishing. Special fixtures could guide the seam into the powered planishing rolls on an automated set-up.

Planishing improves weld seam quality

by Gilbert C. Close • WESTERN EDITOR

WHILE the development of automatic butt welding was a distinct advance over the formerly used lap welding techniques for the production of sheet metal containers and sheet metal pressure vessels, the weld seams produced by butt welding techniques retain two inherent disadvantages: (1) surface roughness which drastically interferes with quality finishing operations, and (2) the weld metal is in an "as cast" condition and therefore is usually weaker and less ductile than the parent metal on either side of the weld seam.

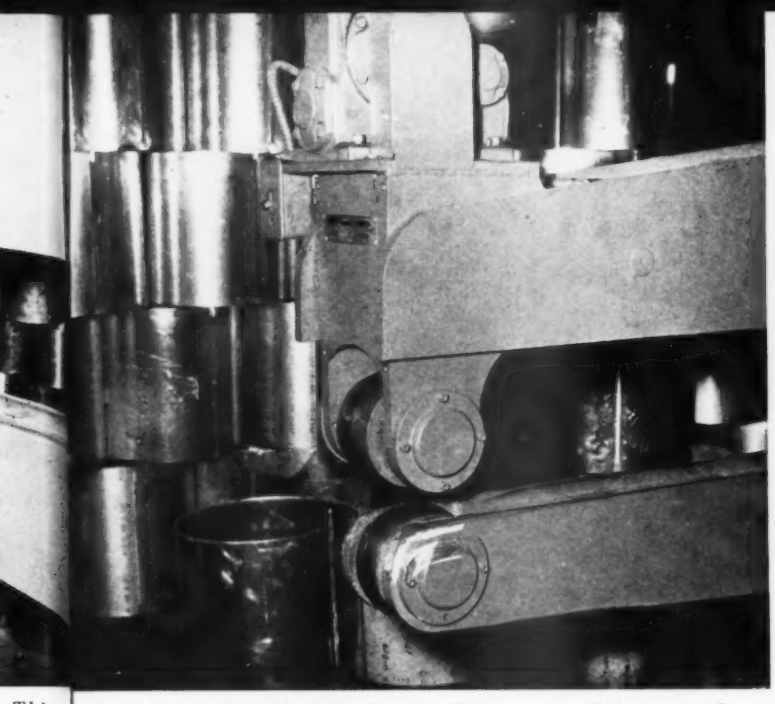
To date, two rather cumbersome and time-consuming operations have been used to overcome these disadvantages. The weld seam is either ground or "shaved" to produce some degree of surface smoothness, and where maximum weld seam strength is required or where post-welding pressure forming is necessary, the butt welded structure must be heat treated to improve the metallurgical characteristics of the weld metal.

Note: For more information on weld planishing write to *finish* on your company letterhead.

Development of a weld seam planishing machine promises to overcome these butt weld seam disadvantages in a single simple operation. Immediately after welding, the weld seam is merely fed between a pair of pressure rolls, or a pressure roll and a supporting mandrel, and sufficient force is applied to actually crush the weld metal flush with the parent metal surface. This takes care of the weld seam roughness and produces a surface ideally suited to quality finishing.

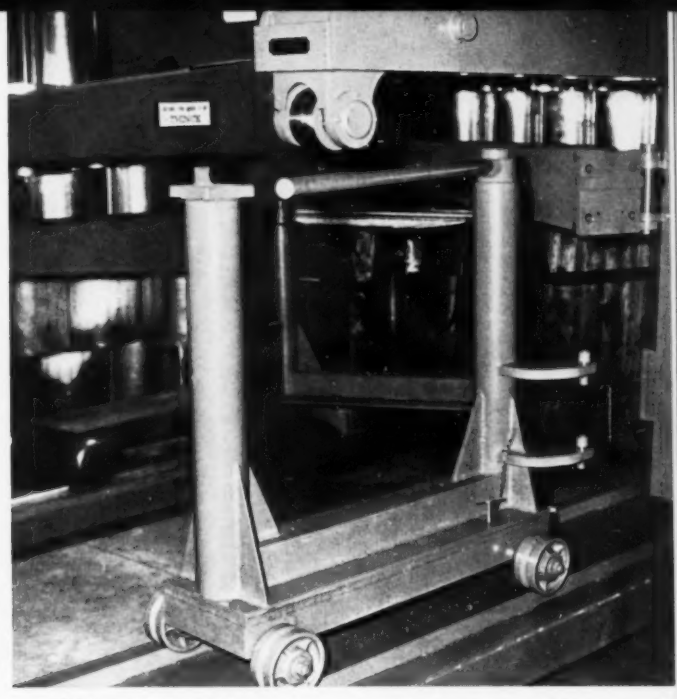
But more happens than is visible to the eye. During this crushing action the weld metal is cold worked sufficiently to materially reduce its metallurgical grain size, increase its strength and increase its ductility to a point where post-weld pressure forming without heat treatment can be accomplished.

In comparative laboratory tests tensile test coupons cut across the same weld seam, part of which was planished, were pulled to destruction. The coupons containing the planished weld seam exhibited up to 50 per cent more tensile strength than



This plan- wered

Details of the planishing head. The upper roll is powered. Pressure can be obtained through either a hydraulic or pneumatic mechanism.



With the hinged lower pressure roll swung out of the way, this track-guided and hinged mandrel can be used for planishing weld seams in tubular structures too small to fit over the rather massive lower pressure roll.

coupons containing the unplanished section of the seam. While the unplanished welds consistently broke in the weld, a large number of the planished welds were stronger than the parent metal on either side of the weld.

From aircraft and guided missile components to water heater tanks

The various large aircraft and guided missile companies with their large production quotas of butt-welded sheet metal structures (pods, drop tanks, napalm bombs, etc.) are working with the new planishing process, and several of the larger companies have already installed a number of the new planishing machines. In this type of work, along with maximum strength, an ultra-smooth exterior weld surface is vital to aerodynamic efficiency.

West Coast manufacturers of sheet metal containers (drum, industrial pails, etc.) and pressure vessels (mainly water heater tanks), attracted largely by the weld seam smoothing possibilities of planishing, are becoming vitally interested in the new process. One large manufacturer of steel drums has already installed the planisher to smooth the mash welded seams on the drums. Up until this time the seams have been smoothed by a slow and costly hand grinding operation. Other companies which have been "shaving" the seams to obtain some degree of smoothness are investigating the planishing process with great interest.

Perhaps the greatest possibility for the planisher in the home appliance industry will be to smooth the butt welded seams on water heater tanks prior to application of the now popular "glass" finish. The frit application to form these vitreous finishes is usually in the neighborhood of 0.005-inch. Any surface roughness whatsoever is detrimental to obtaining a smooth, defect-free vitreous coating. In trial runs vitreous applications over planished weld seams have proved highly satisfactory.

This is what happened when it was attempted to pneumatically pressure form a welded sheet metal cone section in the "as welded" condition. In subsequent trials 95% of the cone structure failed in the weld during forming in the "as welded" condition. Cones with planished welds were then tried, and no weld seam failures occurred. Today the part is in heavy production with a simple planishing operation prior to post-weld forming, instead of a complicated and costly heat treatment.

And in addition to the necessary smoothness, the home appliance company engineers who have conducted these tests point out that the weld seam metallurgical quality is vastly improved by the cold working action.

The weld planishing machine itself is almost as simple as the operation that it performs. The upper pressure roll in the model shown is power driven and acts to drag the seam

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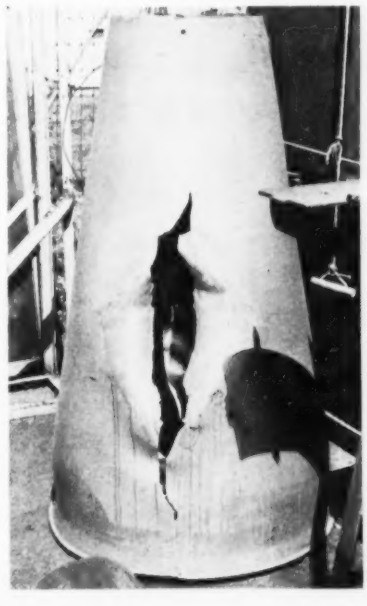

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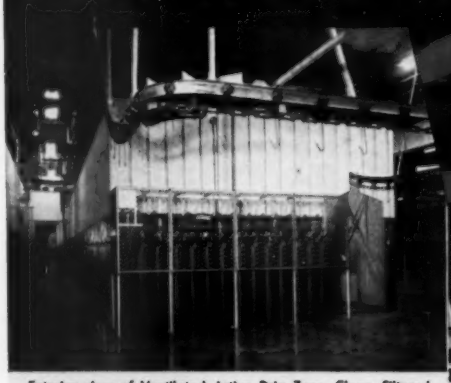

Exterior view of Ventilated Active Drip Zone. Clean, Filtered Air is Supplied to this enclosure. Fume-laden air is exhausted.

View showing glass in one side of Inactive Drip Zone where parts may be seen prior to entering Baking Oven.

View of Mahon Flow-Coating Equipment at Chrysler Corporation of Canada, Limited. This is part of a Complete Mahon Finishing System for Coating Black Enamel Parts.

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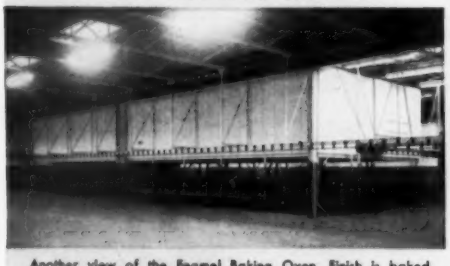
View of Mahon 450° Enamel Baking Oven. Oven is built against ceiling trusses to provide parts storage space below.



Another view of the Enamel Baking Oven. Finish is baked for 20 minutes at 450° in this 80 Ft. x 24 Ft. Mahon Oven.

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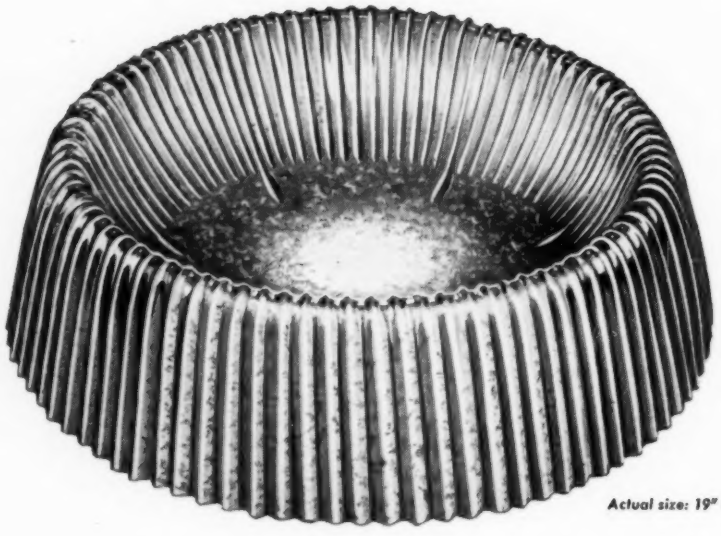

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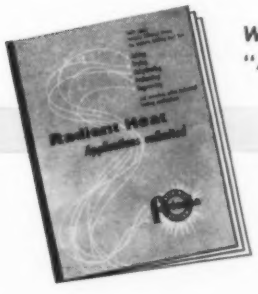

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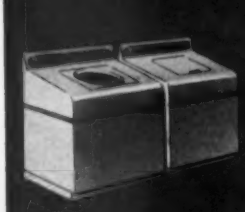

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Removing weld discoloration from stainless steel

→ *from Page 29*

discolored area. *Caution:* Do not permit the bare rod to touch the work and cause a short circuit.

A "pad type" electrode is effectively used for flat surfaces or outside corners. One is the rod type, just described, for inside corner work. The other is a flat copper strip about 1/16" to 1/8" thick by 1/2" to 1" wide, of any convenient length. Sometimes one end of the latter type is bent for easier application.

In both types the working end of the electrode is covered with glass cloth or asbestos paper. The resulting pad is dipped in the electrolyte and applied directly to the discolored area. Continue to keep the pad moist until the work is done.

Power source

Any suitable low-voltage transformer may be used. It is plugged into either a 110 v or 221 v circuit. Satisfactory weld cleaning takes 4 to 24 volts. The higher voltage permits shorter exposure time and is usually required for relatively large areas. The lower voltages require longer time and are practical only for smaller areas. Voltages too high for the area covered cause fuming and spattering. Adjust the voltage to obtain the results you want.

Time required

Intensity of discoloration, area covered by the electrode, and voltage applied govern the time necessary to remove weld discoloration.

The test example shown gives an indication. The work was a right angle joint prepared by inert-gas tungsten-arc welding. The inside of the joint was cleaned at the rate of 4 feet a minute, using a 1/4" diameter copper electrode with a 1" working length and operating at 8 volts a-c. Current measured was 3 amperes. Electrolyte was 50% phosphoric acid. The outside of the joint was cleaned with an electrode covered with glass wool and soaked in the same electrolyte. Cleaning speed was 2/3 feet a minute.

DEFECTIVE PLUMBING-WARE

DEFECTIVE WASHERS AND RANGE TOPS

THE CAUSTIC BATH

THE WASH-OFF

SANDBLASTING

D-ENAMELING SAVES UP TO 50% OF ORIGINAL PART COST

Over the past four years, D-Enameling has more than proved its dollars and cents value to manufacturers of ranges, bathtubs, sinks, refrigerator liners and washing machine tubs. Before D-Enameling, these manufacturers had to scrap defective parts. All the material and labor that went into them was a complete loss. Now, for a small cost, these same manufacturers are able to transform defective parts into first line salable, profit-building products. To cost-conscious management it is obviously smart business to spend a few dollars to save many more. One stove manufacturer, for example, through D-Enameling has been able to save as much as 50% of the original cost of range tops. If you're interested in cutting costs, it will pay you to find out about D-Enameling now. You'll be agreeably surprised how much the simple economics of D-Enameling can benefit you.

May we discuss this soon?

THESE INDUSTRY LEADERS KNOW FROM EXPERIENCE THAT D-ENAMELING TRANSFORMS SCRAP LOSS INTO PROFIT DOLLARS

ARROW SIGN CO. • BRIGGS MANUFACTURING COMPANY • CAPITAL AIRLINES • CHALLENGE STAMPING & PORCELAIN CO. • CLEVELAND-TENNESSEE ENAMEL COMPANY • CONLON-MOORE CORPORATION • CRIBBEN AND SEXTON COMPANY • CROWN STOVE WORKS • DWYER PRODUCTS CORPORATION • ESTATE HEATROLA DIVISION • FLORENCE STOVE COMPANY, Kankakee • GIBSON REFRIGERATOR COMPANY • GLOBE AMERICAN CORPORATION • GRAY & DUDLEY CO. • ICE COOLING APPLIANCE CORPORATION • LAWNDALE ENAMELING CO. • A. J. LINDEMANN & HOVERSON COMPANY • MAGIC CHEF INC. • MALLEABLE IRON RANGE COMPANY • MAYTAG CO. • MURRAY CORP., Scranton • NORGE DIVISION, Effingham • NORGE DIVISION, Muskegon Heights • PRENTISS WABERS PRODUCTS CO. • GEO. D. ROPER CORPORATION • RHEEM MANUFACTURING CO. • SAMUEL STAMPING & ENAMELING CO. • A. O. SMITH CO. • THE ENAMEL PRODUCTS COMPANY • TYLER FIXTURE CORPORATION, Waxahachie • WHIRLPOOL CORPORATION, CLYDE DIVISION

New Process *D-Enameling* Corp.

Highland and New Haven Avenues • Aurora, Illinois

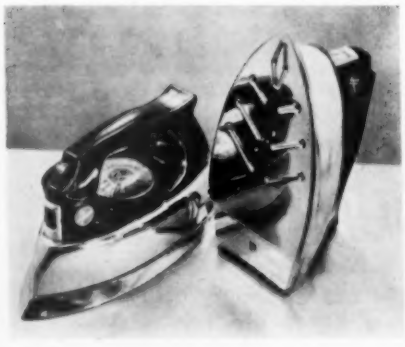
Craftsman — *rotary lawn mower, made by Newark Stove, has a one-piece 24 x 20½-inch aluminum housing. Note the thin walls and cored holes in both views at left. Die casting the mower housing permitted such design features as an inset wheel for edge trimming and a large cut-grass discharge outlet.*

The role of die castings in product design

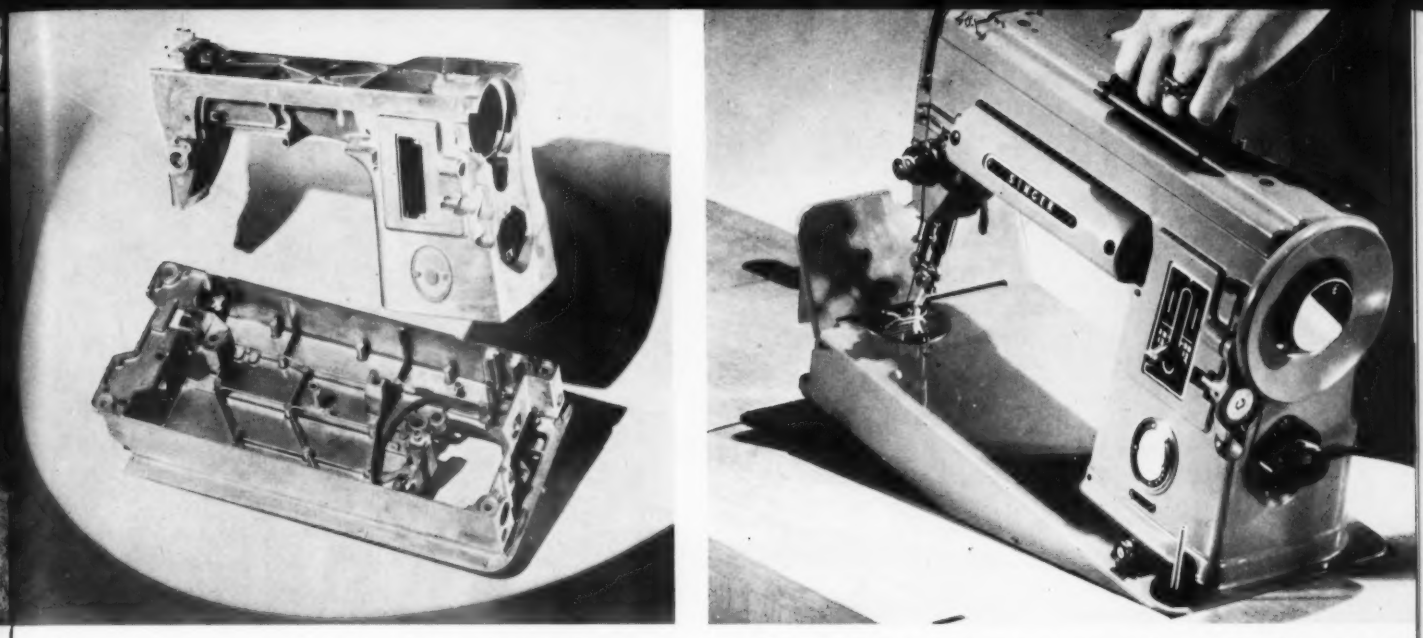
including examples of the use of aluminum and zinc die castings and a novel idea incorporating a stainless steel sheet bonded to an aluminum die casting

MORE and more, product designers are turning to the use of die castings in appliances and other products for the home. Some of the reasons advanced by the American Die Casting Institute for this growing use of die castings is their light-weight, durability, smooth surface finish, and the necessity for virtually no dimensional tolerances in certain applications.

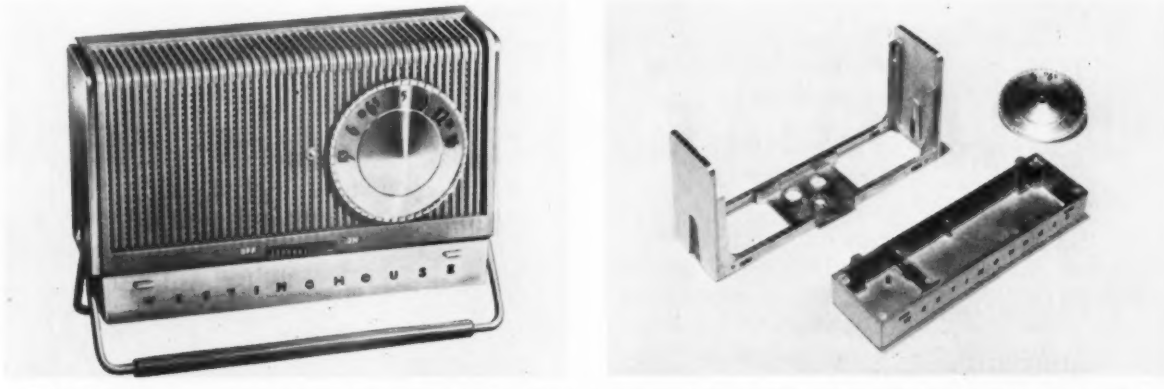
The Institute reports that it expects 1955 to be the best year in the industry's history, reaching a record $400,000,000 in sales, compared to $268,000,000 last year. Supporting this estimate is the greatly increased consumption in the automotive and appliance industries. New aluminum applications, especially in the appliance field—second largest die casting market, are reflected in this metal's rising consumption.



Hoover — *has a stainless steam and dry iron featuring a unique soleplate made by bonding a 0.012-inch stainless steel sheet to a die cast aluminum soleplate. Cross-section reveals intricate shaped soleplate with cast-in heating element.*

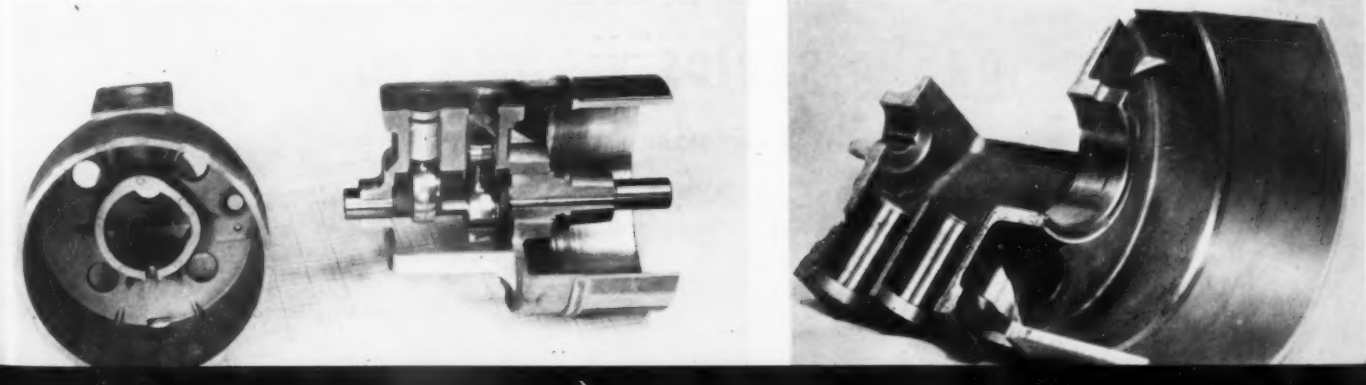


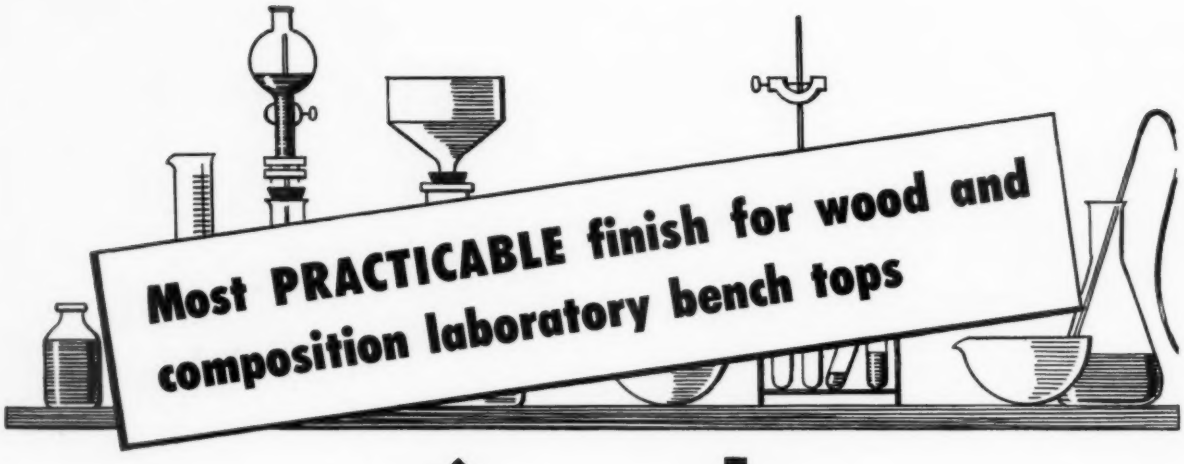
Singer — *uses two large aluminum die castings in its new sewing machine—an intricate thin-walled base and a more complex upper frame (base inverted in photo to show detail). This sewing machine is lightweight—less than half of predecessor model made from iron sand castings. This model can be used interchangeably as a portable or cabinet machine.*



Westinghouse — *has a new Peter Pan series of miniature portable radios which weigh only 2½ pounds and incorporate three brass satin lacquer finished zinc die castings (frame, base and dial) and polystyrene plastic case in assorted colors. Note depressed lettering in zinc die castings.*

York — *room air conditioner has a one-piece compressor and motor housing die cast from aluminum. In photo, below left, is shown motor end of housing along with a cutaway which reveals two die cast pistons and connecting rods. Close-up of halved housing, below right, shows precision and smooth surface of die casting. Note cylinder linings cast-in as inserts in the housing.*





Guardsman®

EPONAIR ENAMEL

TYPE: Epoxy modified with other resins, and catalyzed

APPLICATION: Cold spray with special spray equipment

DRYING: Recoat in one hour

GLOSS: Eggshell

ADHESION: Good

TOUGHNESS: Good

SOLVENT RESISTANCE: Excellent

CHEMICAL RESISTANCE: Good

ADVANTAGES:

Only three coats required and may be applied in one day! Available in colors and white as well as black whereas old systems require 6 to 8 coats with 1 week minimum application time, and are available in black only. Eponair saves production time, increases saleability of the finished product.

USE:

For any wood or composition surface where high resistance to chemicals, and solvents is desired. For 2 years the standard finish of a large manufacturer of laboratory furniture. Perhaps it can fit a requirement of yours.

The Better the Finish, the Better the Buy

GRAND RAPIDS VARNISH CORPORATION

MAKERS OF THE FAMOUS Guardsman® FINISH AND Guardsman® CLEANING POLISH

GRAND RAPIDS, MICHIGAN

How Great Lakes Steel *looks* at quality

SAMPLE "PINS" from heats are sent to a special Quality Control Laboratory where analyses of previous tests by wet chemistry are double checked by spectrograph.

SPECTROGRAPH is used to make doubly certain the finished steel meets the customer's specifications. Here a densitometer reading is made of a spectrogram to determine the percentage of elements present in the steel.

Quality is something you can *see* in our modern laboratories. In the photograph above a spectrogram is readied for reading in the densitometer—and one more test is underway to help assure quality.

Precision control tests such as this one are applied at every stage of production to assure you the quality of steel required for your product and production methods.

At Great Lakes Steel, the emphasis is on quality and service. Where your production problems involve steel —and particularly flat-rolled steel—we invite you to make them *our* problems. Great Lakes Steel is as close as your telephone.

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of

NATIONAL STEEL CORPORATION

T & K sells its open-coil heater business to . . .

TUTTLE ELECTRIC PRODUCTS, INC.

KIRKLAND, ILLINOIS

TUTTLE & KIFT wishes to announce the sale of its open-coil heating unit business and its plant in Kirkland, Illinois, to a new company headed by D. V. Tuttle, a former executive vice-president of the Ferro Electric Products division of TUTTLE & KIFT.

The new organization will continue to make and sell the open-coil heating elements formerly supplied by TUTTLE & KIFT. Its line will include open-coil elements for electric range ovens, clothes dryers, room air conditioners, space heaters, etc., also the patented "Reflectube" type of heater recently introduced for both equipment and industrial applications.

While we are sorry to lose Vern Tuttle and his associates as members of our TK team, we do wholeheartedly wish them every success in their new venture. We know that their multitude of friends in the industry will want to add their best wishes.

John A. Tuttle

PRESIDENT

TUTTLE & KIFT, INC.

TUTTLE & KIFT will continue to market all types of TK and FERRO electric switches and controls at its main plant and headquarters: 1823 North Monitor Ave., Chicago 39, Illinois

Have paint dept. problems got you counting sheep?

SPEE-FLO HAS the ANSWERS

- Are rejects throwing your costs out of line?
- Are time and material costs eating up your profits?
- Are you getting consistent finishing room quality control?
- Are you satisfied with the appearance of your finished product?

Paint department headaches will disappear with Spee-Flo Hot Spray Heaters. Production costs will drop and consistent, all-weather quality control will be established.

We'll be glad to show you facts and figures on how other manufacturers in your field are producing better products at lower cost. Spee-Flo Hot Spray Heaters pay for themselves in the first few weeks of operation*. . . they are long lived and trouble free.

LET US GIVE YOU AN ON THE JOB DEMONSTRATION

SPEE-FLO HOT SPRAY HEATERS

SPEE-FLO CORPORATION
720 POLK AVENUE • HOUSTON 2, TEXAS

THE SPEE-FLO CO., Dept. 1x-5, 720 Polk Ave., Houston, Texas
Builders of practical industrial and automotive hot-spray equipment
Please send me information on your line of hot-spray heaters best suited to our work. Type of products being finished_____
Application is conveyorized____ turntable____ mobile____ other____
Average volume of material per gun per hour_____
Type of material_____ Please have representative call_____
Name_____
Company_____
Address_____
City_____ State_____

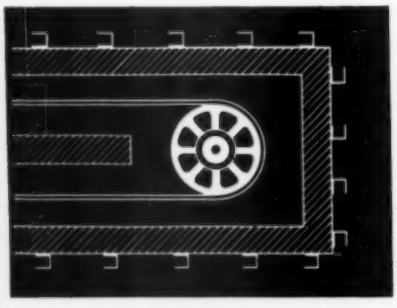
SAVE

5489

Porcelain Enamel Furnaces

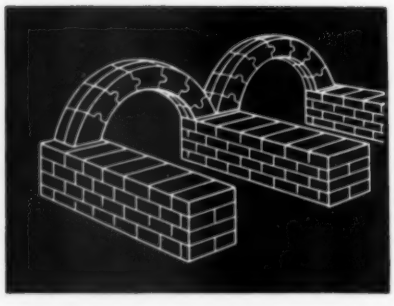
ARE GETTING BETTER AND BETTER!

Ferro-engineered and built furnaces, long the standard for the industry, have been greatly improved—as evidenced by these Ferro developments of the past few years.



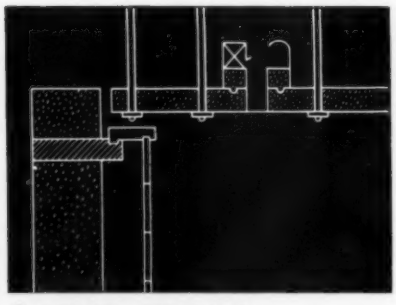
A. GRAPHITE-BEARING WHEEL TURN
cuts "down time," maintenance.

Stands up under continuous service for years, saves costly shutdown for rebuilding of "Roller Nest Turn" previously used.



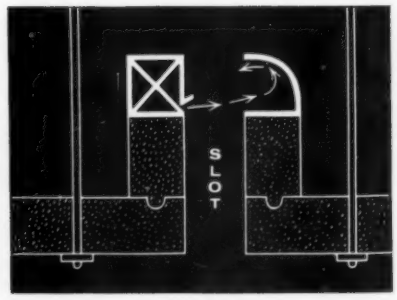
B. IMPROVED COMBUSTION CHAMBERS
built for life of the furnace.

Better refractories, improved design and use of the tongue and groove principle eliminate need for annual shutdown and repairs.



C. NEW FLOATING ROOF
stays put, ends heat leaks.

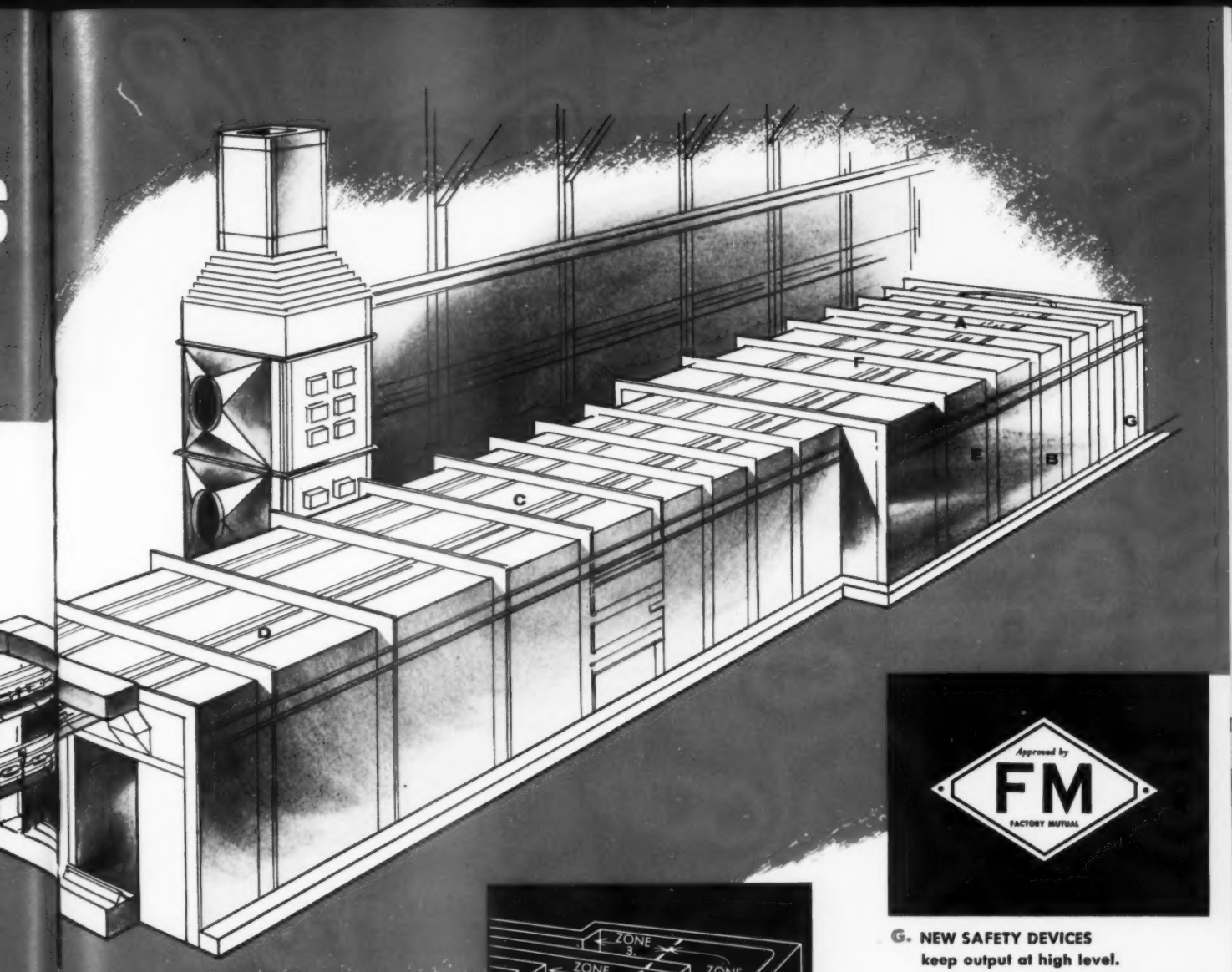
Double suspension from above prevents undue stresses on side wall joints. No leveling needed. Joints are easily sealed, and kept sealed.



D. NEW SLOT SEAL AND AIR CURTAIN
keeps dirt out and heat inside.

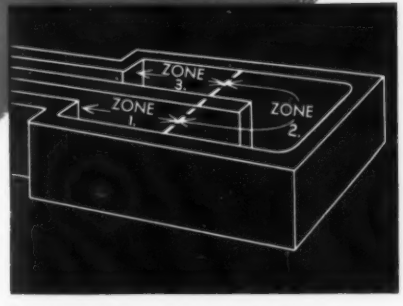
Requires no maintenance. Has no moving parts. Best of all, it eliminates shoe plates and their frequent replacement.

FERRO®



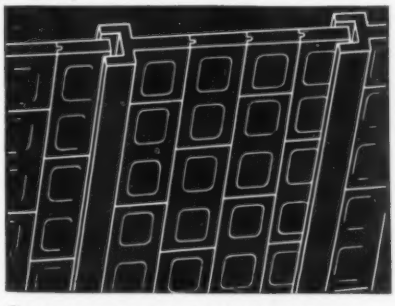
G. NEW SAFETY DEVICES
keep output at high level.

Automatic safety devices with positive alarm signals are good "insurance" against needless down time. Pay for themselves.



F. MULTIPLE-ZONE CONTROL
improves quality, cuts costs.

Gives you absolute control of temperature, horizontally and vertically, and through every foot of the firing zones. No extra length needed.



E. NEW-STYLE ALUNDUM MUFFLE
adds years to furnace life.

Eight-foot section-length and expandable joints permit muffle to expand and contract without damage. Adds stability to side walls and bottom.

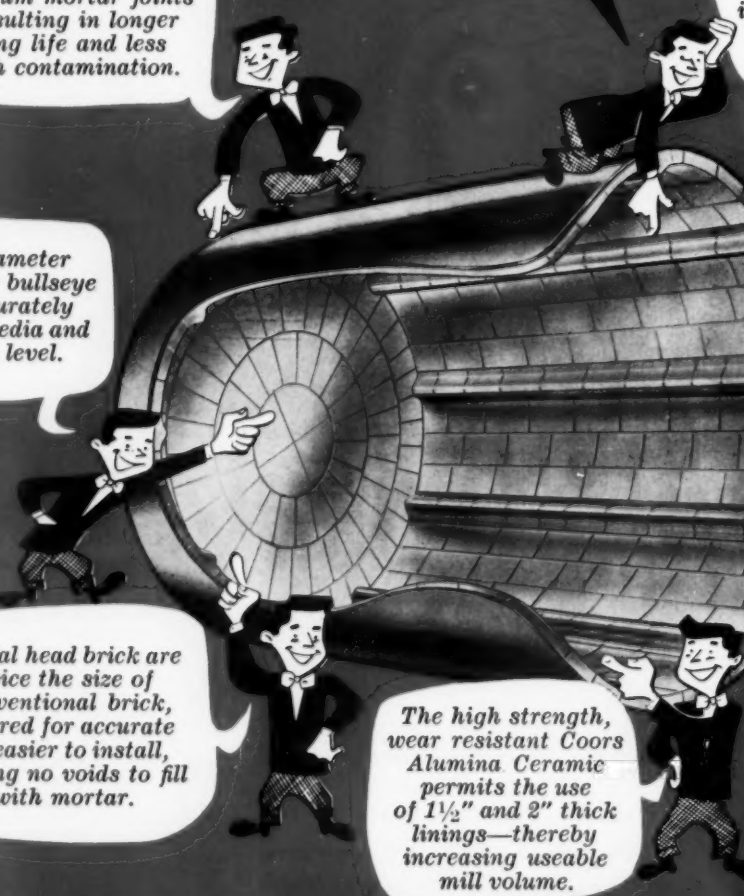
LET US SHOW YOU HOW THESE MONEYSAVING FERRO IMPROVEMENTS CAN BE ADDED TO YOUR FURNACES!

FERRO CORPORATION

Engineering Division

4150 EAST 56th STREET • CLEVELAND 5, OHIO

This is why Coors high density Mill Linings have longer service life...



Precision made brick allow lining to be laid up easily, quickly with minimum mortar joints —resulting in longer lining life and less batch contamination.

Double size shell brick make fewer joints, fewer edges to wear, less contamination, longer life, faster installation. Standard brick 6" long by 4" wide, tapered sides.

12" diameter center is bullseye to accurately judge media and batch level.

Lifter bars increase ball action— thereby reducing grinding time. Furnished in 1½" thick liners, only.

Radial head brick are twice the size of conventional brick, tapered for accurate fit, easier to install, leaving no voids to fill with mortar.

The high strength, wear resistant Coors Alumina Ceramic permits the use of 1½" and 2" thick linings—thereby increasing useable mill volume.

COORS PORCELAIN COMPANY

GOLDEN, COLORADO

Manufacturers of Coors High Density Grinding Media and Mill Linings

National Sales Representatives: LZP Industrial Ceramics
2500 West 7th Avenue
Denver 4, Colorado

COORS PORCELAIN COMPANY
c/o LZP Industrial Ceramics,
2500 West 7th Ave.,
Denver 4, Colo.

Please send me additional information on COORS High Density Linings and Grinding Media.

Name .....

Title .....

Company .....

Address .....

City & State .....

The use of demineralized water in refrigerator production

INCREASING attention to water conditioning in appliance manufacturing plants is typified by the system installed recently in the household refrigerator department of the Major Appliance Division of General Electric Co., Louisville, Ky.

This department has a central water treating system which includes, among other standard equipment, twin de-ionizer units, each with a capacity of 60 gallons per minute. These demineralizers serve both the refrigerator unit and cabinet building. The city water used at the plant comes originally from the Ohio river and is reported to be extremely "hard" at certain times of the year.

The demineralized water is used for

1. Mill room operations in the porcelain enameling department.
2. Cleaning and rinsing operations prior to porcelain enameling.
3. In anodizing certain parts of the refrigerators and freezers.

The advent of color in appliances has brought a new importance to water control as the degree of purity in the water helps in the control of color finishes whether for porcelain enameling or for anodizing.

Less cleaning solution is normally required when conditioned water is used.

Having water available with a known and unvarying factor simplifies mill room operations considerably.

Automatic equipment

The demineralizers perform all their operating functions including the regeneration cycle automatically. Once the unit is put into operation, there are no valves or switches to operate and minimum supervision is required. Whenever the effluent's conductivity falls below standard, the treated water is discharged and a regeneration cycle is actuated.

The regeneration cycle is completely automatic, including rinsing and re-cutting in the effluent when de-

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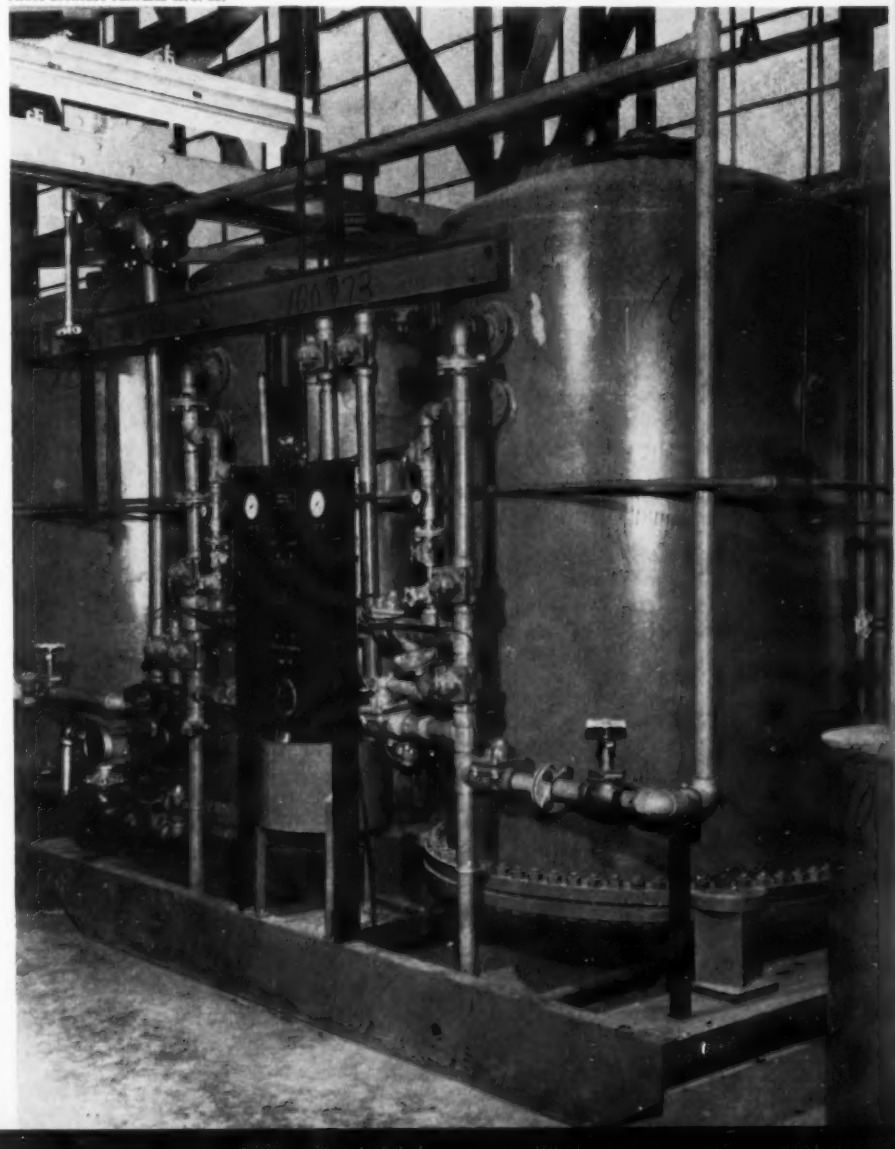
PHOTO COURTESY PENFIELD MFG. CO.



Right: Partial view of twin demineralizer installed as part of the Household Refrigerator Department's central water treating system in General Electric's new Appliance Park manufacturing center at Louisville, Ky. The twin dual-column units are capable of delivering up to 7200 gph of properly conditioned water.

NEWS ABOUT SUPPLIERS

LOUTHAN AND FERRO POWDERED METALS MERGE

Merger of The Louthan Mfg. Co., East Liverpool, Ohio, with Ferro Powdered Metals, Inc., Salem, Ind., has been announced by R. A. Weaver, board chairman, Ferro Corp., Cleveland, parent company of both wholly-owned subsidiaries.

The merged company will carry on both operations under the name of The Louthan Mfg. Co., with the Salem operation to be known as Ferro Powdered Metals Div.

H. T. Marks, executive vice president of Ferro Corp., will be president of Louthan; C. W. Gerster is executive vice president; G. E. Weber is secretary-treasurer; and J. F. Helsel is vice president in charge of the Ferro Powdered Metals Div.

ARMCO SALES SERVICE DEPT.

Organization of a new department designed to streamline the service functions of Armco Steel Corp.'s sales division has been announced by W. B. Quail, manager of the sales division.

James G. Wikoff, formerly manager of the order department, has been named manager of the new department.

CAGEN IS LUX CLOCK CHIEF PRODUCT ENGINEER

The Lux Clock Mfg. Co., Waterbury, Conn., has announced the appointment of George Cagen as chief product engineer. He heads a new department devoted to developing new products and adapting present Lux timing devices to broader application in the original equipment field.

ROBERTSHAW-FULTON ELECTIONS

At a meeting of the board of directors of Robertshaw-Fulton Controls Co. R. S. Reynolds, Jr., was elected chairman of the board, succeeding his father, R. S. Reynolds, Sr., who died on July 29.

The board named J. Louis Reynolds and John A. Robertshaw, Jr. directors. Reynolds is a vice president of Reynolds Metals Co., and Robertshaw is assistant vice president of Robertshaw-Fulton, in charge of foreign operations.

Robertshaw-Fulton Canadian plant — *at Toronto is the first manufacturing facility to be established by the parent firm outside the United States. The plant will supply automatic controls for home appliances to manufacturers in Canada and the British Commonwealth.*

WHEELING STEEL UPS SHEARER

Alexander Shearer has been appointed assistant to the operating vice president of Wheeling Steel Corp., Wheeling, W. Va., according to J. L. Neudoerfer, president.

CONSOLIDATED INDUSTRIES NAMES BAUER & DAILY

H. J. Berman, president and general manager, Consolidated Industries, Inc., Lafayette, Ind., has announced the appointments of Joseph E. Bauer and Bernard E. Dailey. Bauer has been added to the engineering department, and Daily is in charge of the planning department.

TUTTLE ELECTRIC PRODUCTS BUYS FERRO SUBSIDIARY

D. V. Tuttle, president, Tuttle Electric Products, Inc., has announced the purchase by his company of the open coil heating element business of the former Ferro Electric Products, Inc., Kirkland, Ill., now the Ferro Switch & Control Div. of Tuttle & Kift, Inc., Chicago. The sale includes the manufacturing property at Kirkland, Ill., where production will be continued by the new owner.

Ferro Switch & Control Div. is being moved to the Chicago plant of Tuttle & Kift.

OLIN MATHIESON APPT.

Appointment of David T. Marvel, vice president of Olin Mathieson Chemical Corp., as vice president in charge of sales of the Metals Div., has been announced by Thomas S. Nichols, president.

STEGEMAN BUYS BARROWS PORCELAIN ENAMEL

Barrows Porcelain Enamel Co., Cincinnati, has been purchased by Robert H. Stegeman, Cincinnati businessman.

W. A. Barrows, founder and president, is retiring from active management but continues in an active advisory capacity.

Stegeman was associated with the

Wadsworth Watch Case Co., Dayton, Ky., as manager of one of its divisions and a director.

THIEBLOT IS VITRO DIRECTOR

Armand J. Thieblot has been elected a director of Vitro Corp. of America, New York City, announced J. Carlton Ward, Jr., president. Thieblot is president of Thieblot Aircraft Co., Inc., Bethesda, Md.

ALCOA TO EXPAND ALUMINUM PRODUCTION

A program to expand its Wenatchee works through addition of aluminum smelting equipment has been announced by Aluminum Co. of America, Pittsburgh.

The project will involve the installation of additional pots in each potline at a cost of $2 million. Capacity of the works to produce primary aluminum will be increased to about 100,000 tons annually.

JERVIS EXECUTIVE CHANGES

R. E. Jervis, chairman of the board, Jervis Corp., has announced the resignation of V. E. Mark as president and general manager. He is succeeded by Jack R. Jervis, formerly executive vice president.

Martin A. Felix, who was vice president in charge of manufacturing, succeeds Jervis as executive vice president. Both men have been elected to the board of directors.

BINKS EXPANSION

Binks Mfg. Co. has broken ground for an expansion of its plant in Franklin Park, Ill. The addition, which increases the area of the present plant by 15,552 feet, will be completed in December, 1955.

The new extension will house operations of pipe fabrication, air compressor manufacturing facilities and the sheet metal engineering dept.

MCCUNE IS SHARON STEEL GENERAL SALES MANAGER

J. J. Kraus, vice president in charge of sales, Sharon Steel Corp., Sharon, Pa., announced that R. C. Garlick, assistant vice president and general manager of sales, is being relieved of the office of general manager of sales. W. J. McCune has been appointed general manager of sales.

GEORGE CAGEN

J. G. WIKOFF

R. S. REYNOLDS

A. SHEARER

BORG-WARNER DIVISION PRESIDENT RETIRES

The retirement of W. B. Caldwell from the presidency of the Calumet Steel and Franklin Steel Divs. of Borg-Warner Corp. and the election of Howard J. Davis to succeed him have been announced.

MINN. MINING INORGANIC PRODUCTS PROJECT

Appointment of Dr. John L. Rendall as manager of the new inorganic products project has been announced by Minnesota Mining & Mfg. Co., St. Paul, Minn. The new lead free frit is being developed as a decorative finish for aluminum.

G. Charles Hann has been appointed sales engineer, and Warren R. Beck has been named research and product development manager of the project.

CENTURY VIT ANNOUNCES NEW TOP LEVEL TITLES

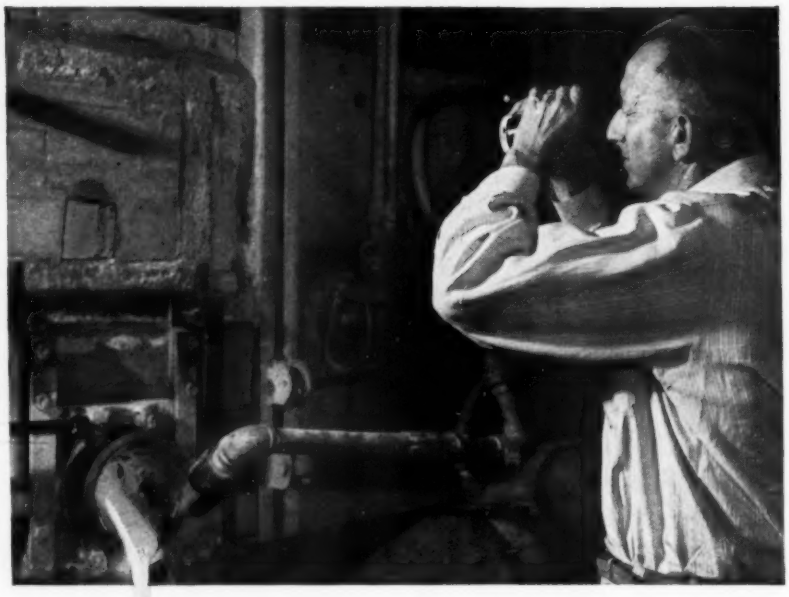
George Sirovy, Sr., president, Century Vitreous Enamel Co., Chicago, has announced new titles and responsibilities for three company executives.

George Sirovy, Jr., with the company for 17 years, has been made executive vice president. Roger Fellows is vice president and manager of the frit division, and Herman Bernick, secretary and treasurer of Thor Corp., is secretary and treasurer.

National Safety Award to Pemco — *John P. Rostmeyer, second from left, managing director of the Baltimore Safety Council and representing the National Safety Council, presents an Award of Honor plaque for an excellent safety record to Anthony J. Lubertine, plant superintendent of Pemco Corp., Baltimore, Md. Also on hand for the presentation are members of the plant safety committee (background, left to right) Louis Langley, Robert Ott, William Hoover and Michael Friesner.*

Q. Why do we emphasize the "scientific controls" used by Pemco in production of frit and colors?

A. Because they are important factors in keeping YOUR costs down



High manufacturing standards assure consistent uniformity and fewer problems on your production line. Fewer production problems lower your costs!

Your product deserves the best looking, the best wearing, the most saleable finish . . . Porcelain Enamel. Standardize on Pemco Frits and Colors . . . give your product these sales advantages while enjoying the production benefits made possible by Pemco's controlled manufacturing processes.

Pemco Engineers—in the field and in our laboratory—are at your service in developing the finish with the characteristics you require and in working with you on application and production techniques. To secure detailed information about Pemco's wide line of frits and colors . . . write direct to:

PEMCO CORPORATION • BALTIMORE 24, MARYLAND

Manufacturers of "*The World's Finest*" Porcelain Enamel Frits for steel, cast iron and aluminum; Coloring Oxides; Screening Pastes; Glaze Frits; Body and Glaze Stains; Underglaze and Overglaze Colors; Vitrifiable Glass Colors.

ARFT IS SERVEL V P

R. J. Arft has been appointed vice president and assistant to the president of Servel, Inc., Evansville, Ind., according to Duncan C. Menzies, president.

Arft, who will work with the general management of the company in the control of costs and expenses, was formerly executive vice president, general manager and comptroller of the Martin-Parry Corp., Toledo, Ohio.

BOEHLER TO HEINTZ APPLIANCE POST

J. J. Boehler has announced his appointment as manager of the appliance division of Heintz Mfg. Co., Philadelphia.

Boehler, who was formerly manager of the enameling division, now has the responsibility of the enameling department, water heater department, press shop #2, dryer assembly department and the refrigeration, brazing and heat treating department.

LAU BLOWER BUYS PLANT

It is reported that Lau Blower Co., Dayton, Ohio, has purchased a plant in Azusa, Calif.

MRS. KIENE RETIRES AS WESTINGHOUSE INST. HEAD

Announcement has been made by Mrs. Julia Kiene, director of the Westinghouse Home Economics Institute, Mansfield, Ohio, of her retirement from the company and the formation of Julia Kiene, Associates, Consultant Service.

Associated with Westinghouse for over 17 years, Mrs. Kiene is the author of several books and is known as a lecturer, having averaged over one hundred speeches a year during her career at Westinghouse.

MAYTAG NAMES COX ASSISTANT SECRETARY

J. D. Cox, former office manager of The Maytag Co., Newton, Iowa, has

been elected assistant secretary by the board of directors.

Cox joined Maytag in 1946 as branch office supervisor and was named office manager in January, 1950. He succeeds E. L. Nelson, who is retiring after 30 years of service.

ARMSTRONG PERSONNEL CHANGES

Armstrong Furnace Co., Columbus, Ohio, has announced the resignation of Larry Hickok, former executive vice president. George Zimbelman, western division sales manager, has been transferred to the Columbus plant as assistant general manager. Charles L. Brooks, formerly assistant to the president, has been promoted to sales manager.

DEANE IS U. S. S. HOMES VP

Andrew Deane has been elected vice president — materials, United States Steel Homes, Inc., New Albany, Ind., H. D. Moulton, president of the housing subsidiary of U. S. Steel, has announced.

TOLEDO PORCELAIN ENAMEL PRODUCTS NAMES CRUMLEY

It is reported that R. T. Crumley has been named sales manager of Toledo Porcelain Enamel Products Co., Toledo, Ohio, subsidiary of Bettinger Corp., Waltham, Mass.

FLORENCE STOVE NAMES TROW

W. H. Trow, Jr., has been appointed district manager, Florence Stove Co. of the Chicago downtown area, it was announced by R. D. Putman, vice president.

GENGER IS FLORENCE STOVE FACTORY MANAGER

John P. Wright, chairman of the board, Florence Stove Co., has announced the appointment of Victor K. Genger to the newly created position of factory manager, the Florence Kankakee, Ill., plant.

SHAREHOLDERS APPROVE HUPP-PERFECTION MERGER

The stockholders of Hupp Corp. and Perfection Industries, Inc. in separate meetings August 29th approved the plan to merge the two companies. Perfection becomes the

Perfection Industries Div. of Hupp Corp.

Officers of the company created by the merger are Don Gearheart, president; Donald S. Smith, vice president; John B. Fowler, vice president; Willard A. Giddens, treasurer; and Manning E. Case, Jr., secretary.

NORGE NAMES SCHAEFER REFRIGERATOR SALES MANAGER

Appointment of Bert Schaefer as refrigerator sales manager has been announced by R. C. Connell, vice president of sales, Norge Sales Corp., Chicago.

Schaefer was with Admiral Corp., Chicago, for eight years, the last seven as appliance and refrigerator sales manager.

TRONE JOINS SERVEL

Curvin J. Trone, Jr., has been appointed special assistant to the vice president and general manager of the home appliance division at Servel, Inc., Evansville, Ind., announced John H. Wall, vice president and general manager.

WESTINGHOUSE UPS ROSENBERGER

The appointment of Edward W. Rosenberger as assistant to the manager of Westinghouse portable appliances has been announced by John J. Anderson, manager. Rosenberger was formerly assistant advertising manager for portable appliances.

SECOND U. S. STEEL "OPERATION SNOWFLAKE"

U. S. Steel Corp., Pittsburgh, is offering manufacturers the opportunity to participate in a second industry-wide Christmas promotion of major appliances.

Like the first "Operation Snowflake", the 1955 campaign will use the slogan "Make It a White Christmas — Give Her A Major Appliance." It will again urge the purchase of dishwashers, ranges, refrigerators, freezers, water heaters, dryers, washers and ironers.

A. O. SMITH RESEARCH APPTS.

Wayne Deringer, former director of ceramic-organic research at A. O. Smith Corp., Milwaukee, has been appointed an associate director of research. Succeeding Deringer as director of ceramic research is Forrest W. Nelson, formerly assistant director of this laboratory. Wesley G. Martin, a former assistant director of research, is technical director coordinating the efforts of the central research laboratories.

W. A. DERINGER

F. W. NELSON

PERMUTIT PLANT APPTS.

The Permutit Co., New York, N.Y., has announced the promotions of H. M. Appleton and H. Plymire, according to George N. Proctor, vice president.

Appleton has been appointed assistant plant manager of the Lancaster, Pa., manufacturing division. Plymire has been appointed plant superintendent.

PAINT & VARNISH CLUB MAKE $300 GRANT

An educational grant of $300 has been made by the Federation of Paint and Varnish Production Clubs to the Birmingham, England, Paint, Varnish & Lacquer Club to assist in the club's educational program.

WESTINGHOUSE MODERNIZES SPRINGFIELD, MASS., PLANT

To provide facilities for the production of compressors for room air conditioners, the Westinghouse Electric Corp. has begun a fourth program of modernizing, re-equipping and enlarging portions of its plant in Springfield, Mass., James R. Weaver, plant manager, has announced.

VANCE IS MAYTAG CHICAGO BRANCH MANAGER

Joseph R. Vance, assistant manager of the Chicago branch office of the Maytag Co. for the past two years, has been promoted to branch manager, according to Claire G. Ely, general sales manager.

McCORD PLANT ADDITIONS

McCord Corp., Detroit, is constructing 40,000 sq. ft. of additional manufacturing space at its Washington, Ind., plant and 35,000 sq. ft. to its Wauseon, Ohio, plant.

PMI NAMES DASCHNER MANAGING DIRECTOR

Harold A. Daschner has been appointed managing director of the Pressed Metal Institute by the board of directors at the summer board meeting in Cleveland.

Daschner, who has been with the Institute in the capacity of assistant manager and acting managing director, replaces Orrin B. Werntz, retired.

PERMUTIT PERSONNEL MGR.

H. W. Foulds, president, The Permutit Co., New York City, has announced the appointment of Charles A. Weida as personnel manager.

WESTINGHOUSE NAMES PRICE CHAIRMAN & PRESIDENT; ELECTS KEY EXECUTIVES

Gwilym A. Price, Westinghouse Electric Corp., has been elected chairman and president by the board of directors. Filling a position which has not been occupied since 1951, he also continues as chief executive officer.

Mark W. Cresap, Jr., vice president and assistant to the president, is executive vice president and deputy chief executive officer. Latham E. Osborne, a board member since 1953, was elected vice chairman of the board.

John K. Hodnette, formerly vice president in charge of the apparatus products divisions, was elected vice president-general manager and a member of the board.

The position left vacant by Hodnette's promotion was filled by A. C. Monteith, vice president in charge of engineering and research. Succeeding Monteith in that post is Dr. John A. Hutcheson, director of the Westinghouse Research Laboratories since 1949 and a vice president since 1950.

G-E APPOINTS SCOTT

The appointment of Frederick T. Scott as manager of marketing for General Electric's industry control dept. has been announced by B. W. Mahoney, who was recently named general manager of the department.

RHEEM ADDS FACILITIES TO CHICAGO PLANT

New manufacturing facilities representing 64,000 sq. ft. of floor space are being added to the Chicago plant of Rheem Mfg. Co., it has been announced by J. P. Makenas, region manager.

The new addition is the 13th successive expansion to be built on the Rheem plant, originally constructed in 1941. It has been made necessary by growth in the Rheem business of manufacturing warm air furnaces and central air conditioning units for homes and in the transfer of clothes dryer activities to Chicago from the West Coast.

NORGE NAMES COLLIER MGR., KEY ACCOUNTS

Appointment of Edward B. Collier as manager of key accounts for Norge Div., Borg-Warner Corp., Chicago, has been announced by R. C. Connell, vice president of sales.

INDUSTRIAL FURNACE SALES UP

Orders for furnaces and control equipment for July, 1955, bettered the record of a year ago by almost three times, Carl L. Ipsen, executive vice president of the Industrial Heating Equipment Association, has announced.

The figure for July, 1954, on net orders received was $1,664,029. For July, 1955, the figure is $4,356,266.

MAGIC CHEF GAS RANGE APPT.

Albert W. Gruer, Jr., market research manager and assistant to the president, Magic Chef, Inc., St. Louis, Mo., has been promoted to gas range merchandise manager, announced Kenneth O. Dupree, general sales manager.

Enamel Bibliography 1950 — 1954

Publication of an "Enamel Bibliography" covering the years 1950 — 1954 is being undertaken by the Enamel Division of the American Ceramic Society, according to an announcement by William W. Coffeen, chairman, Enamel Bibliography Committee. Other members of this committee are D. G. Moore and R. F. Patrick. The bibliography, tentatively scheduled to issue late in 1955, will list, abstract and index all pertinent articles of interest to enamelers for the five year period covered. It will provide a readily available source of information on all phases of enameling and should prove invaluable to research, production, service and control personnel in the enameling industry.

However, it was announced at the same time that publication is contingent upon the receipt of a sufficient number of cash orders to cover the cost of printing and distribution. Pre-publication price has been set at $5.00 per copy. After publication, cost will be $7.50. For further information, contact: R. F. Patrick, Pemco Corporation, 2554 Greenmount Ave., Baltimore 18, Md.

MECKSTROTH JOINS WESTINGHOUSE

Donald R. Meckstroth has joined Westinghouse Electric Corp., Pittsburgh, as manager of marketing services for the air conditioning division at Staunton, Va., it was announced by J. A. Gilbreath, division manager.

KOSCH IS BRYANT SALES MGR.

Philip C. Kosch, formerly sales training manager, has been appointed sales manager of Bryant Div., Carrier Corp., Indianapolis, Ind., it was announced by Howard L. Clary, vice president and general sales manager.

KETTERING TO PRESENT KEYNOTE ADDRESS AT PAINT MEETING

Dr. C. F. Kettering, research consultant to the research laboratories division of General Motors Corp., will present the Keynote Address at the 33rd Annual Meeting of the Federation of Paint and Varnish Production Clubs at the Hotel Statler, New York City, October 3 - 5.

Dr. Kettering has headed and directed research organizations since

1909. Some of the developments resulting from his experimental work include: the automotive self-starter, high-compression automobile engines, improved automotive finishes and Freon refrigerant.

His personal inventive achievements and his leadership and direction in several fields of research have won him 25 honorary degrees from colleges and universities, various citations and awards.

VACUUM CLEANER SALES UP

Factory sales of standard-size household vacuum cleaners in July totalled 207,758, up 7.3% over 193,607 cleaners in July, 1954, and down 14% from 241,665 in June. The January-July total was 1,825,757, 20.4% over the same period last year, according to the Vacuum Cleaner Manufacturers' Association.

NEMA 6-MONTH FIGURES

National Electrical Manufacturers Association has announced the following figures for the first six months of 1955: sales of electric ranges, 701,626; electric household refrigerators, 2,081,702; electric storage water heaters, 358,936; electric farm and home freezers, 356,846.

ORGANIC FINISH REPLACES PLATING FOR SERVEL COPPERTONE FINISH

Servel's new Coppertone finish, optional on the upper door of its two-door refrigerators, is a sprayed-on, baked enamel with the same resistance quality of the "Newtone" white used on the other exterior parts.

The organic coating replaces the copper plating used in 1954, first year of the company's dual-tone models. The report states that both the new Coppertone and the white will withstand 100 percent humidity and 110° F. temperature for 2,000 hours.

"The new finish is not only more durable and generally superior to the old, but it costs about 50% less to produce", John H. Wall, vice president and general manager of the home appliance division at Servel, Inc., reports.

At the factory, the Coppertone finish is applied to a Newtone white primer. First, a copper powder is mixed with an organic liquid to obtain the desired shade. This is sprayed on the door surface, after which a clear coat is applied for gloss and depth. The finish is then baked for 30 minutes at 300° F.

Servel paint engineers are now working on an air-dried lacquer for use in the field where no baking facilities are available and "touch-ups" prove unsatisfactory. Under these conditions, the lacquer would replace the factory-used organic liquid in mixture with the copper powder, and no baking would be required. Thus, the Servel two-tone refrigerator owner whose copper finish is damaged will be able to have the work done quickly by men in the field.

GAS FURNACE SHIPMENTS AT RECORD LEVEL

Edward R. Martin, Gas Appliance Manufacturers Association, director of marketing and statistics, reported that 412,100 gas-fired warm-air furnaces were shipped to dealers and distributors during the first seven months of the year, an increase of 35.1% over the same period in 1954. Shipments in July set a record for that month of 67,800 units, a gain of 27.4% over July, 1954.

John E. Chambers, *— founder of Chambers Ranges, Inc., inspects the "In-A-Top broiler-griddle unit of the firm's new "anniversary model" range, featured in a special promotion to mark the firm's 45th anniversary.*

AHLMA 7-MONTH FIGURES

Factory sales of home laundry appliances for the first seven months of 1955 totalled 2,977,461 units, 30% higher than the corresponding 1954 period, Guenther Baumgart, executive director of the American Home Laundry Manufacturers' Association, has announced.

July, 1955, sales amounted to 311,466 units, 8% over July, 1954.

WATER HEATER SHIPMENTS SET JULY RECORD

Edward R. Martin, Gas Appliance Manufacturers Association, director of marketing and statistics, reports that July gas water heater shipments were the highest on record for that month with 212,500 units, a 11.7% increase over the same period last

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Soaring Appliance Sales for '55...

make the finish market better than ever!

The postwar revolution in America's homes, putting labor-saving appliances to work for millions and millions of American housewives, continues unabated in 1955. Every forecast indicates that more appliances will be sold in 1955 than in prosperous 1953 and 1954 (first quarter reports substantiate this forecast), and appliance manufacturers need more and more raw materials, components, equipment and services to keep production in line with a record demand for their products.

In this booming appliance field, one publication —finish—has shown consistent long-term gains in circulation, service and advertising performance

CIRCULATION: finish provides coverage of all specifying buyers in qualified-by-volume appliance manufacturing plants—and provides a bonus coverage of key personnel in other fabricated metal products manufacturing plants. The continuous growth of **finish** circulation has a direct relation to the expansion of the field; only qualified readers in qualified plants have been added.

SERVICE: "From raw metal to finished product," **finish** alone blankets the operating and buying problems of the similar-in-scope appliance and fabricated metal products manufacturing fields.

ADVERTISING PERFORMANCE: finish has far outstripped the postwar advertising performance of indusrial publications as a group—more than tripling the percentage of average revenue gains since 1944.

SUMMARY OF SHIPMENTS (Typical segments only—data not available for many groups)

Product	Units Shipped 1954
Air Conditioners, room	1,230,000
Electric Appliances	59,712,000
Cooking & Heating Equipment (non electric)	8,967,606
Home Laundry Equipment	4,584,887
Plumbing Ware	5,841,017
Steel Containers	96,850,000
Steel Kitchen Cabinets	3,372,000
Vacuum Cleaners	2,658,136
Total Units	183,215,646

HERE'S HOW THE APPLIANCE FIELD IS BOOMING IN '55

Estimated Volume Gas Appliances 1955/1954

Domestic gas ranges	+ 5.6%
Automatic gas water heaters	+ 1.9%
Gas-fired warm air furnaces	+ 8.0%
Gas-fired boilers	+ 4.3%
Gas-fired conversion burners	+ 2.6%

Estimated Sales 1955 Electrical Appliances

3,500,000	Refrigerators
1,000,000	Freezers
1,250,000	Ranges
800,000	Water heaters
1,000,000	Room air conditioners
2,500,000	Automatic washers

YOUR SALES TO VOLUME BUYERS LIKE THESE CAN BE BIGGER THAN EVER TODAY!

Here's what some typical appliance plants need to keep them in full-scale operation.

PLANT B.—receives between 80-100 *highway* trailers loaded with materials daily, including such items as: 4 miles of tape; 600 gallons of white enamel; 2,000 gallons of lubricants; 200 tons of sheet steel; 93 tons of bar steel; 20 tons of electric motors; 41 miles of electric wiring.

PLANT C.—Receives 60 *carloads* of raw materials per day, including 410 tons of steel.

PLANT D.—Uses the following materials for packaging *each day*: 3 miles of tape; 1,500 pounds of steel strapping; 25 tons of corrugated fibre board; 4,000 square feet of crepe cellulose.

Sources of data and estimates: Gas Appliance Manufacturers' Association; National Electrical Manufacturers Association; Electrical Merchandising.

Tailored to deliver maximum coverage of qualified—and interested—buyers, finish represents a unique selling opportunity for you. Make it *first choice* on your schedule, just as it has become *first choice* for more and more advertisers every year since its founding!

Dana Chase PUBLICATIONS

BPA ESTABLISHED 1944 NBP

YORK STREET at PARK AVENUE

ELMHURST, ILLINOIS

TErrace 4-5280

The Magazine of Appliance and Metal Products Manufacturing

This advertisement appeared in the 1956 Market Data and Directory Number of Industrial Marketing.

One of the more common uses for heavy gauge wire products is in the commercial refrigeration field. To provide circulation of cold air, super market frozen food display freezers require racks of adequate strength and construction. PEERLESS supplies thousands of these racks to the manufacturers of the finest commercial refrigeration display units. These racks are constructed to specifications in a variety of gauges, weights and stock shape . . . round, flat or square.

You may have a different problem . . . in gauges, application or design. PEERLESS can supply unusual and economical wire products up to ½" diameters resistance welded at all points of contact. Finishes can be Zinc electroplate with Chromate treatment or Poly-vinyl to specifications.

Write today for this new 8-page brochure showing PEERLESS facilities for service to you. *It's yours for the asking!*

PEERLESS WIRE GOODS COMPANY, INC.
2700 PERRY STREET • LAFAYETTE, INDIANA

A Motor for LOW SPEED OPERATION

If you are now manufacturing a product or developing a product where you need motion at slow speed, here is the motor for you. Hundreds of thousands now in use on cooking appliances, vending, coin operated, amusement, and advertising displays.

These AC gear motors are precision built and are being manufactured in volume for immediate delivery. For further information, send the requirements of your application to us. Special motors are built to meet your new product needs. Write today for data sheet.

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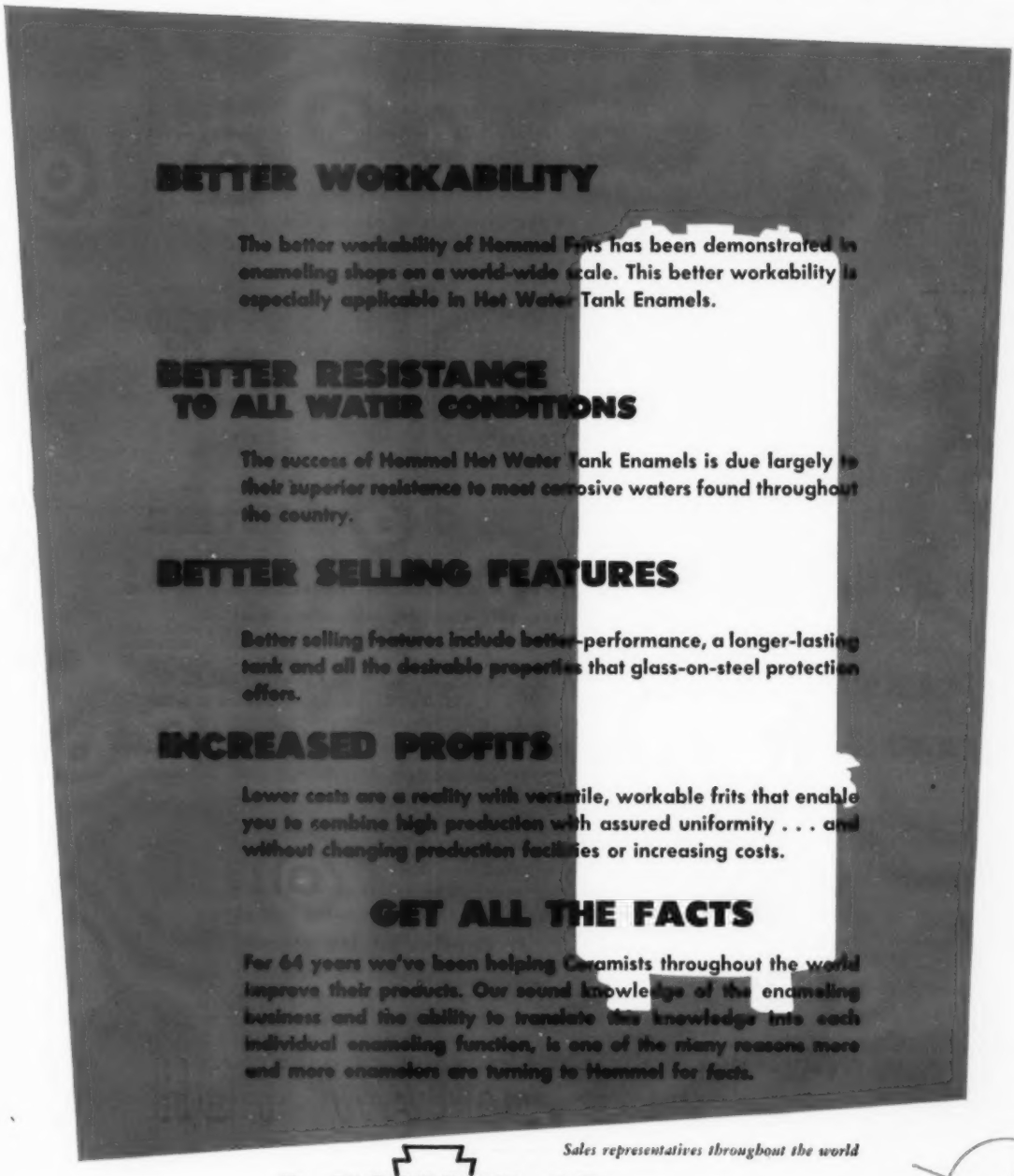
RACINE, WISCONSIN

Designers and Manufacturers of
SPECIAL INDUCTION MOTORS

here are the facts about **HOMMEL**

HOT WATER TANK ENAMELS

and what they mean to you...


BETTER WORKABILITY
The better workability of Hommel Frits has been demonstrated in enameling shops on a world-wide scale. This better workability is especially applicable in Hot Water Tank Enamels.
BETTER RESISTANCE TO ALL WATER CONDITIONS
The success of Hommel Hot Water Tank Enamels is due largely to their superior resistance to most corrosive waters found throughout the country.
BETTER SELLING FEATURES
Better selling features include better performance, a longer-lasting tank and all the desirable properties that glass-on-steel protection offers.
INCREASED PROFITS
Lower costs are a reality with versatile, workable frits that enable you to combine high production with assured uniformity . . . and without changing production facilities or increasing costs.
GET ALL THE FACTS
For 64 years we've been helping Ceramists throughout the world improve their products. Our sound knowledge of the enameling business and the ability to translate this knowledge into each individual enameling function, is one of the many reasons more and more enamelers are turning to Hommel for facts.

Sales representatives throughout the world

THE O. HOMMEL CO. PITTSBURGH 30, PA.

POTTERY • STEEL AND CAST IRON FRIT
CERAMIC COLORS • CHEMICALS • SUPPLIES

Our Technical Staff and Samples are available to you without obligation. Let us help with your problems.

"The World's Most Complete Ceramic Supplier"

West Coast Warehouse, Laboratory and Office, 4747 E. 49th Street, Los Angeles, California

Processing small metal products at low unit cost

(Continued from Page 27)

benches. Kitch'n Handy steel parts are kept in large metal bins in an adjoining section . . . and by use of the bins one girl instead of two rackers can attach the items to the hanging racks fast enough to keep up with production. The last is the general unracking chrome area and some general unracking and reracking for brass, bronze and copper paint. (The plated parts are put on an endless conveyor to go through a paint booth for clear coat of hand sprayed clear metal finish.)

Behind the rack up area is from left to right the pre-plate aluminum line, the pre-plate zinc line and then the main plate line. All are parallel. The end tanks of the first two line make a 90 degree turn to the right and end where needed about half way down the first leg of the main line.

The aluminum line (side by side tanks) includes: emulsion cleaner, spray, rinse, aluminum cleaner, rinse, nitric and hydrochloric rinse, zinc immersion, rinse and then into nickel plating on the main line . . . after sulphuric dip.

The zinc pre-plate line set up is: cleaner, spray rinse, die cast cleaner, rinse, copper strike, then to the main plate line where the racked zinc die cast parts are put on prior to the 10 per cent sulphuric dip.

Brass parts go through either the aluminum or zinc pre-plate lines . . . to the main line, the same as the zinc die cast parts.

The main plating line is a full automatic machine with a 30 minute cycle. It is 71 feet long, 142 feet for the complete narrow oval line.

Steel parts are hung on the endless conveyor hooks at the start of the line and automatically move from one tank to the next: heavy duty cleaner, warm and cold water rinse, hydrochloric acid 30 per cent solution, rinse, another cleaner, water spray, 10 per cent sulphuric, rinse, nickel plate (better than 5000 gallons of nickel solution). A filter installation near the end of the main line filters 4500 gallons of the solution per hour. At the end of the line is an electrolytic purification tank. The time in the nickel solution varies . . . most hardware is in 10-15 minutes.

The chrome parts go through drag out, or recovery tank which pumps back the nickel to the nickel tank, then to rinse, chrome tank, chromic acid recovery rinse, rinse (cold and hot), air stripping of excess water, steam heat dryer . . . and out the main line.

Code rings are used on brass, bronze and copper racks which are pulled off the main line prior to chrome plating. They get a cyanide treatment, then go to their respective tanks, rinsed, chromate pacificating dip (to keep parts from discoloring) in a separate line of tanks. They then are put back on the main line prior to hot water rinse and continue on that line until they reach the end.

At present bright nickel parts are being barrel plated as they tumble in

to Page 72 →

Quality stampings and castings!

THE VOLLRATH COMPANY, with 81 years of experience in metal fabricating and finishing, can meet your requirements for quality components. Our diverse, modern facilities include complete foundry services . . . offer you an opportunity for fast, dependable delivery of ferrous and non-ferrous products including stainless steel stampings and castings — *at less than it costs to produce them in your plant.*

Illustration shows a few of the products which can be manufactured by Vollrath. Vollrath is also a great name in stainless steel and porcelain enameled housewares and institutional ware; stainless steel utensils for the dairy and food processing industries; rotary power lawn mowers and power hand saw attachments for home use.

***Write us today:* Contract Sales Division, The Vollrath Co.,**
SHEBOYGAN, WISCONSIN

put up a good front with the help of Titanox®

Colorful porcelain-enamel exterior panels are real "comers" in building construction. And TITANOX-TG titanium dioxide in the frit is the key to high acid-resistance and lifetime weather-resistance. In titania enamels, TITANOX-TG and TITANOX-TG-400, although notable for whites, are the basis for modern architectural pastels.

TITANOX-TG and TITANOX-TG-400 are made especially for porcelain enamels. Their free flow, easy handling, efficient melting and uniformity result in lower costs for the frit maker. TITANOX-TG-400 is specifically designed for blue-white enamels.

Our Technical Service Department will be glad to assist you with your frit formulation problems. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. *In Canada:* Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

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brightest name in the finish

3450

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Subsidiary of NATIONAL LEAD COMPANY

poor paint adhesion?

FREE MANUAL
shows how phosphating will solve your problems!

If poor paint adhesion is your problem, chances are you'll find the solution in the Turcoat Phosphating Manual. This booklet describes the complete Turcoat line, tells the full story of phosphating and includes a valuable "Phosphating Reference Chart," which quickly gives the answer to any paint adhesion problem.

If you are interested in permanent paint adhesion, write today for the Turcoat Manual. There is no cost or obligation.

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You will be assured of a *permanent paint seal*, simply by using Turcoat as a bond for organic finishing.

Please affix coupon to company letterhead
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Please send me a copy of the Turcoat Manual without cost or obligation.

Name_____
Title_____ F

Finishing home laundry equipment at Hotpoint

→ *from Page 34*

marshalling area which feeds the assembly lines.

The cover coat furnaces are also of the electric U-type. Both furnaces are rated at 1000 kw but are being expanded to over 1500 kw to take care of anticipated production needs.

Three-story mill room

A feature of the new porcelain enameling facilities is a new 3-story mill room. Frit and other raw materials are stored on the top floor and delivered by stainless-steel chutes to grinding mills on the ground floor.

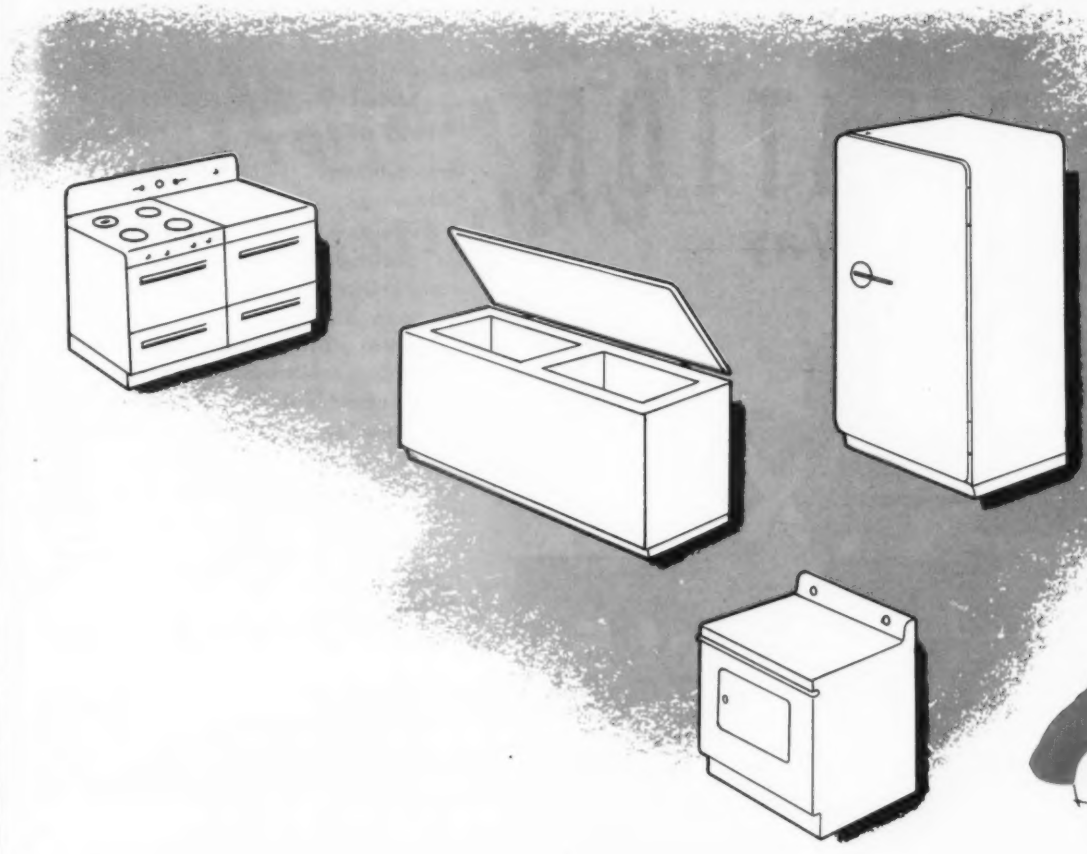
Mills range from laboratory-size up to 5000-pound units. Space has been provided for future 7500-lb. mills. When mills need relining, high density brick is used.

Milled enamel is discharged by gravity to a container and then pumped to storage tanks on the second floor which is air conditioned to keep enamel viscosity constant. Enamel slip is stored in twelve 300-gallon and three 1000-gallon stainless-steel clad tanks. Three 1000-gallon all-stainless steel tanks will be installed soon.

From storage the slip is discharged by gravity to the main floor, passing through a centrifugal sieve and a magnetic separator into pressure tanks for delivery to spray room, or open-type stainless-steel tanks for delivery to the dip tanks. The company is now testing a pilot set-up for delivery of enamel slip direct from storage to spray booths through stainless-steel piping.

The enamel control laboratory, also maintained on the second floor, houses all of the essential equipment for checking of materials and control of operations. Specific gravity is maintained at 16, and thickness of the ground coat is kept at 3 mils, and cover coat at 4 mils.

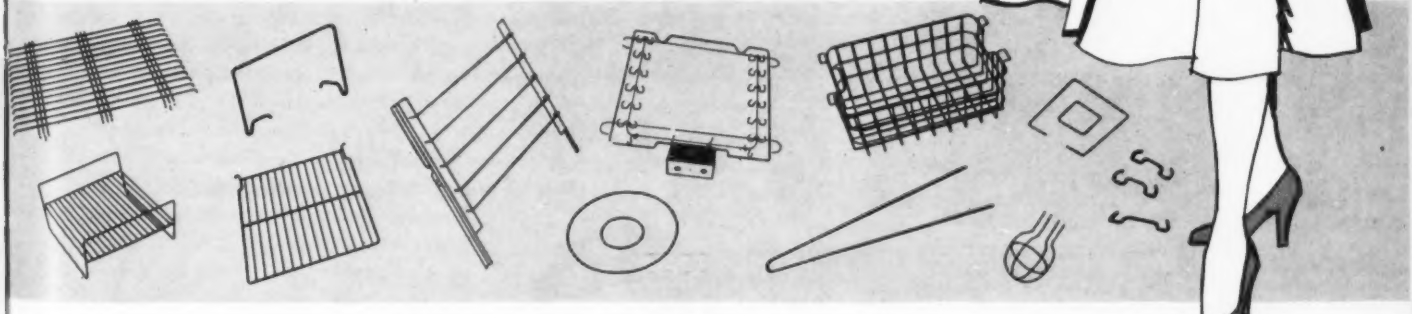
A 15-ton air conditioning unit runs full time to maintain a constant temperature of 75°F. On especially hot days an additional 10-ton unit cuts in automatically to help maintain the temperature.



there is yet no substitute for USP quality

So long as consumer satisfaction is to be measured in years. Your product . . . your appliance, must stand up to the rigors of continuous service while providing complete convenience, dependability as well as lasting beauty. You can't afford to compromise quality for price at any point. You can't afford to gamble on delivery dates. Why then, not choose the one best source for your welded wire components? Take advantage of Union Steel's fifty years of leadership in the design, fabrication and delivery of better, more dependable wire products.

Why not let Union Steel's engineers assist you in planning and producing a welded wire part that will make your product more efficient?



If it's made of wire . . . Union Steel will make it best! No matter how simple or complex, regardless of the finish to be applied, Union Steel's engineers, craftsmen and inspectors will guarantee the utmost in styling, dependability and lasting quality.

UNION STEEL PRODUCTS CO.

ALBION, MICHIGAN

AUTOMATION
the Nickeloid Way

Even before they arrive at your plant, Nickeloid PRE-Plated Metals are 60% through your production process. No cleaning, plating or polishing . . . that's been done for you—expertly, uniformly, accurately. You just fabricate; then assemble. By-pass 3 out of 5 basic production steps. Reduce costs up to 20%; save time and lower investment in inventory and equipment.

Specify Nickeloid PRE-Plated Metals, in durable uniform finishes of chrome, nickel, copper or brass on base metals of steel, zinc, copper, brass or aluminum.

SHEETS • COILS • STRIPS
A variety of finishes and patterns

SEND FOR FREE SAMPLER-SELECTOR
In handy slide-chart form, gives specifications, finishes and typical uses of Nickeloid Metals. 8 metal samples. Request yours on your company letterhead.

NICKELOID METALS
SINCE 1898

Sales offices in most principal cities

AMERICAN NICKELOID COMPANY
Peru 11, Illinois Mills: Peru, Ill. — Walnutport, Pa.

. . . small metal products

→ *from Page 68*

their solution . . . rather than use racks.

A separate automatic plate machine for cad-plating drawer slides and mixer bracket parts is located behind the main line. It is air operated (main line is hydraulic and electric). The various tanks used are: cleaner, rinse, hydrochloric 25 per cent solution, rinse, cadmium solution, three rinses, hot water . . . and off line to assembly. This is a one-man operation. He handles 120 racks an hour . . . from 2 to 6 parts per rack.

Samples of solutions are taken for analysis and quality control . . . and daily additions are made.

Painting operations

All color parts (brass, bronze and copper) are processed through the paint booth after they come off the main line. They are placed on a 75 foot endless, overhead trolley conveyor which passes through the air suction booth. A prime coat (metal etch) is put on some steel hinges. A paint heater is used for clear enamel (used for brass copper. Bronze has some pigment). Over seven mils film thickness is sprayed on.

The sprayed parts pass through a long, overhead strip heater electric oven of three sections with 16 heating units in each section. It takes 11-12 minutes to get the right bake. As the baked parts come out of the oven the conveyor dips down on a U-turn near the floor . . . so that the parts can be removed readily a rack at a time and taken to nearby packaging tables.

Much of the packaging of the "million-and-one" parts is done on tables set at right angles to the conveyor. The tables are equipped with the latest packaging machines. In addition there is a large packaging and assembly room between the fabrication shop and the polishing-plating packaging area. Each table is equipped with continuous conveyor belt system. Cost savings resulting from careful time studies have been worked out here as elsewhere in the plant.

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HAVE YOU SEEN THE NEW

Westinghouse

Refrigerators?

WHEN YOU DO YOU'LL SEE

TINT-TANIUMS

an exclusive Chicago Vit development

To capture its share of today's style-conscious, color-conscious consumer market, Westinghouse Electric Corporation has added fresh new sales appeal to its line of refrigerators in a number of ways. One of them is through the use of Tint-Taniums on **LINERS AND HUMIDRAWERS.** These colored frits. made exclusively by Chicago Vit, provide a number of distinct production advantages foremost among them being unequalled color stability. They are handled as easily as white titanium frits, and completely eliminate the chance for human error that exists in systems where colors are added at the mill. Tint-Tantiums also bring you a number of distinct economic advantages. So, if you plan to use colors in your new products, you'll find it profitable to choose Tint-Taniums. There's nothing else like them!

SPRAYING FOOD LINERS AND DIPPING HUMIDRAWERS IN TINT-TANIUMS AT WESTINGHOUSE ELECTRIC CORPORATION, COLUMBUS, OHIO

Tint-Taniums are easily applied by either spraying or dipping (without streaking and without oxide separation) depending upon the requirements of the individual parts involved. They may be applied at lighter weights of application and may be spot-sprayed without resulting color differences. The above pictures taken on the refrigerator production line at Columbus, Ohio, show how Westinghouse Electric Corporation sprays food liners and dips Humidrawers in Tint-Taniums.

THERE'S NOTHING LIKE TINT-TANIUMS

Chicago Vitreous CORPORATION

1425 South 55th Court • Cicero 50 Illinois

*Tint-Tanium is a copyrighted name

WEAN EQUIPMENT CORPORATION

22800 LAKELAND BOULEVARD

CLEVELAND-17-OHIO

REPLY TO
22800 LAKELAND BLVD.
CLEVELAND 17, OHIO

WARREN OFFICE
347 N. PARK AVENUE
WARREN, OHIO

A letter of interest to Every Press User!

Dear Sir:

During the last year our company has developed a new press of revolutionary design.

We have conducted a series of tests on this machine which has been witnessed by a large group of press experts. The net impression of these people seems to indicate that our development may preface sweeping changes in the whole field of metal stamping.

It was our original intention to restrict the application of this press to certain specialized industrial fields but it is now apparent that it has the broadest possible application and the pressure to release general information regarding its performance has been overwhelming.

We, therefore, use this open letter as an invitation to authorized personnel to see this machine in operation.

If you will express your desire in letter form on company stationery, it will receive our prompt attention.

Very truly yours,

WEAN EQUIPMENT CORPORATION

R. J. Wean, Jr.

R. J. Wean, Jr.
President

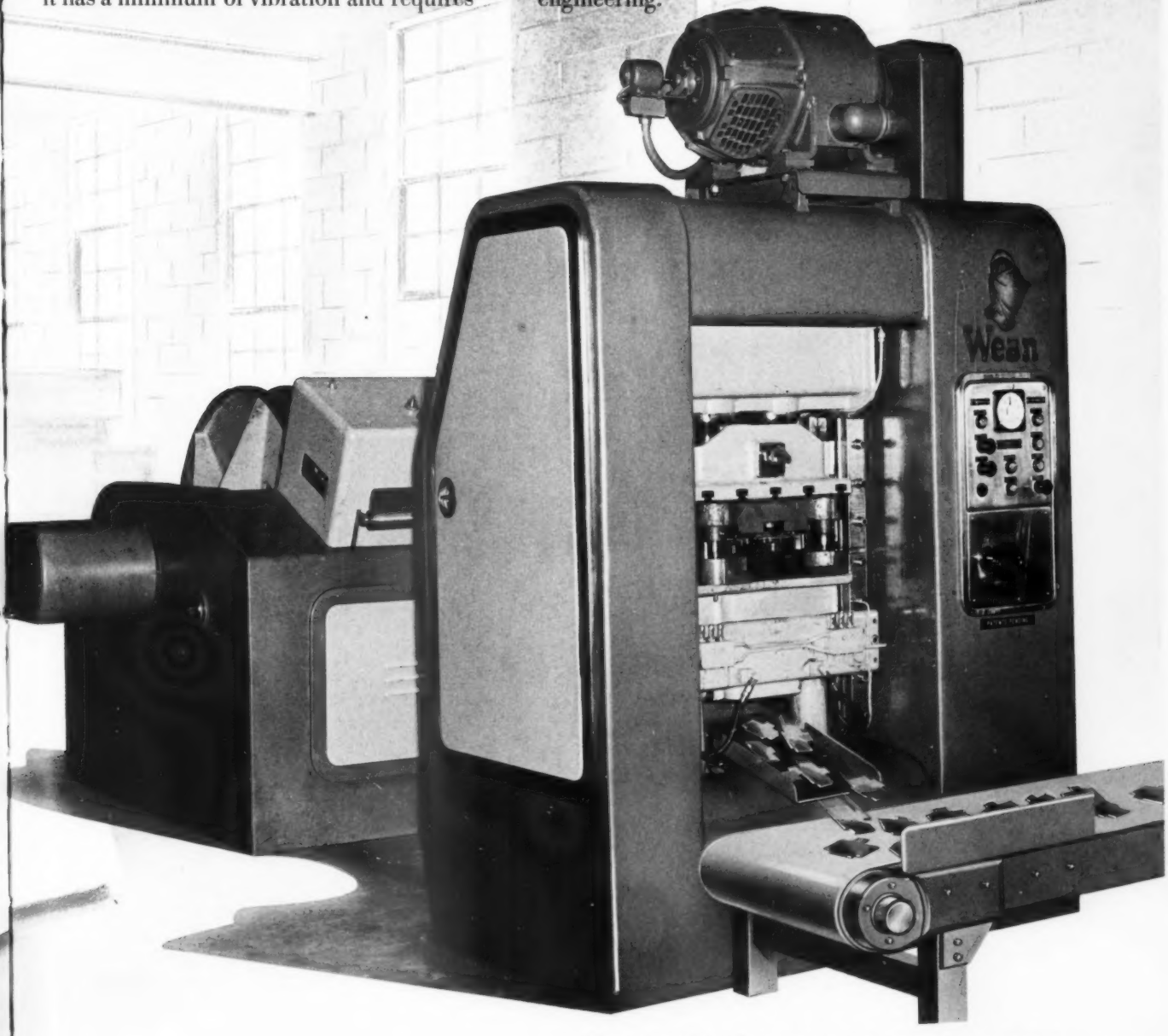
Wean

FLYING PRESS

Designed primarily for speed of operation, the Wean Flying Press is the first machine of its kind to successfully combine the fast operating advantages of continuously fed strip with dies which move with the strip.

The press differs greatly from conventional machines. Machine tool-like in appearance, it has a minimum of vibration and requires no foundation. In addition to its great speed, it incorporates several new design principles that should interest every press user.

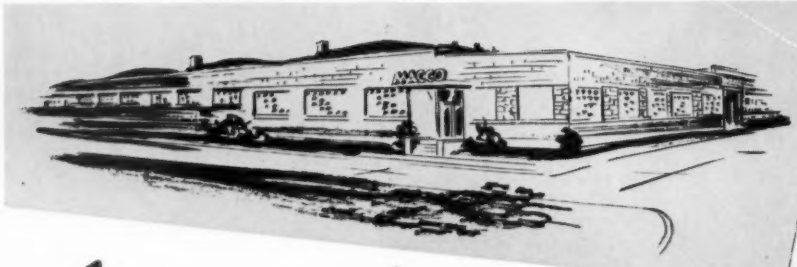
An automatic adjustment of feed length while press is in motion, and the absence of a clutch and brake (the most frequent points of maintenance on conventional presses), are two examples of this advanced engineering.

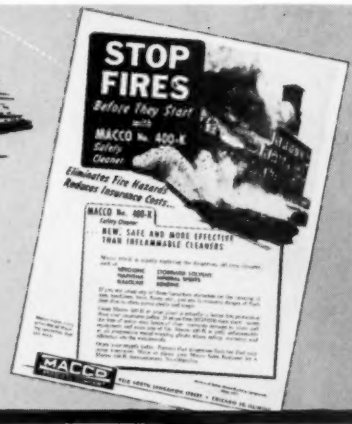


Wean 60-ton Flying Press stamping out automotive hinge plates at 600 pieces-per-minute, using the same die set which on a conventional press made the parts at a rate of but 90 pieces-per-minute.

Wean EQUIPMENT CORPORATION Cleveland, Ohio

Chicago Newark, N. J. Detroit





6 years of SALES SATISFACTION

MACCO advertising in* finish *has paid regular dividends in sales through more than 75 consecutive months

Statistics can tell but part of the story of **finish's** consistent record of advertising performance. **finish,** of course, has an unbroken record of growth in number of advertisers, pages, and revenue. But, in addition, it is important to review the sales results that advertisers in **finish** have achieved— results that establish **finish** as the outstanding medium for advertising directed to the appliance and metal products manufacturing field.

The MACCO story is just one typical example of the sales results that measure the value of advertising in **finish**. Yet it shows, in detail, the reasons why more and more advertisers are putting **finish** first on their schedules.

What better evidence is there that **finish** can do an equally effective job for you of concentrating on the key men, whatever their titles, who make or influence buying decisions for appliance and metal products manufacturers.

Dana Chase **PUBLICATIONS**
YORK STREET at PARK AVENUE
ELMHURST, ILLINOIS

MACCO PRODUCTS COMPANY

G. A. CAIRNS, *General Manager, The Macco Products Co., writes:*

"We have used* finish *on a monthly basis for the past six years. . .We originally selected it to reach one section of the metal products industry . . . during the first year of advertising, sales to this section more than doubled.

"We use* finish *for all of our products because we have found that we are reaching the type of personnel that we wish to reach in the entire fabricated metal products industry.

***"We were quite astounded at the results of the ad which you recently ran on our Macco No. 400-K. Within one week after our first advertisement appeared, we shipped nine tons of the new material. We assure you that we intend to continue our contract with* finish."**

BPA
NBP

This advertisement appeared in the August 1955 issue of Industrial Marketing.

→ *from Page 64*

year. Shipments for the first seven months of the year reached a total of 1,616,600 units, 22.4% over the first seven months of 1954.

BEARDSLEE TO ASTE COMMITTEE

Election of Kenneth R. Beardslee, general manager of Carboloy Dept., General Electric Co., as a member of the Research Fund Committee of the American Society of Tool Engineers, has been announced by the ASTE board of directors.

W. H. ADAMS 20TH YEAR AS INDUSTRIAL DESIGNER

Wilbur Henry Adams has announced the celebration of his

twentieth year as an industrial designer. His first job was a porcelain enamel stove for Perfection Stove Co., and he was one of the earlier users of porcelain for store-front use.

His article, "Something new in the range picture", was published in the December, 1946, issue of *finish*.

NORGE EXPANDS CONSUMER FINANCING IN 7 STATES

Branch offices of B-W Acceptance Corp. are being opened in Birmingham, Ala., and Kansas City, Mo., to provide consumer financing assistance for Norge appliance dealers in seven states.

James T. Brown, B-W Acceptance vice president, announced that the new offices extend Norge retail financing service to 13 states.

JULY GAS RANGE SHIPMENTS UP 11.2%

Edward R. Martin, Gas Appliance Manufacturers Association, director of marketing and statistics, reported that during July 149,500 gas ranges were shipped to distributors and dealers, compared to 134,500 shipped during July, 1954, an increase of 11.2%.

This makes a total of 1,272,100 ranges shipped during the first seven months of the year, a 13.3% increase over the 1,123,100 shipped in the same period in 1954.

NORRIS IS DENISON ENG. VP

It is reported that P. W. Norris has been promoted to vice president and director of sales, Denison Engineering Co., Columbus, Ohio.

to Page 80 →

Expand enameling volume with Du Pont Porcelain Enamel for Aluminum

This protective and decorative Du Pont finish for aluminum offers many important features and advantages.

Lifetime finishes of Du Pont porcelain enamel resist abrasion, thermal shock, impact and flexing . . . can be sawed, sheared, drilled and punched without spalling.

And these rugged coatings add rigidity to aluminum sheet, allowing you to use lighter gauge aluminum and cut packaging and shipping costs.

FOR MORE INFORMATION on how you can expand your enameling volume and increase customer satisfaction by adding aluminum enamels to your line of finishing service, mail the coupon below.

DU PONT
VITREOUS ENAMEL
FOR ALUMINUM
DU PONT
BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

MAIL THIS COUPON TODAY

E. I. du Pont de Nemours & Co. (Inc.) F-10
Electrochemicals Dept., Wilmington 98, Del.

☐ Please send me a copy of your free booklet on Du Pont Porcelain Enamel for Aluminum.

*Name*_____ *Position*_____
*Firm*_____
*Address*_____
*City*_____ *State*_____

Inspection methods for metallic parts

(Continued from Page 37)

proximately 30 minutes to permit the penetrant to seep into all fissures and drain from the surfaces. Then, they are washed with a water spray which removes excess penetrant.

While still wet, the parts are sprayed with a developer compound which consists of a colloidal suspension of powdery materials. The developer is dried by placing the parts in an oven for five minutes. As the developer dries, it draws the fluorescent penetrant from the crevasses to the surface by capillary attraction. By viewing the parts in a "black light" booth the exuded particles may be observed to glow with a fluorescent brilliance under the ultra violet radiation.

The exact pattern and location of each defect is vividly displayed by the glowing particles. The depth of the defect may be estimated by the amount of penetrant which emerges from the fissure.

Penetrants with exceptionally good properties of surface tension, and viscosity can reveal surface cracks in non-porous materials which are only a few millionths of an inch in size. Because the method requires various types of equipment, fluorescent penetrant inspection at Ryan is accomplished on a conveyor system which carries the parts through the application, washing, drying and viewing operations. Fluorescent penetrant possesses a particular advantage for parts which are to be reworked at a later time. The fluorescent particles remain permanently in the metal cracks so that once treated, a part may be inspected many times after that by simply subjecting it to ultra violet light.

Dye penetrant

The dye penetrant inspection method is a simplified version of fluorescent penetrant. It, too, is a mechanical method of detection which is extremely efficient in locating defects that extend to the surface. It requires an absolute minimum of equpiment which can be readily carried by an inspector. Consequently, it is valuable as a means for inspecting in the field and for checking large immobile structures which cannot be handled by other methods.

The only equipment needed are quantities of dye penetrant, solvent and developer compound and three brushes. Parts must be cleaned free of all oil and grease before examination. The penetrant, which is a low-viscosity, high capillarity fluid containing a red dye, is applied to the surface. This can be done by brushing, spraying or dipping. Five to fifteen minutes is allowed to permit the penetrant to soak into surface imperfections. Then, all penetrant is removed from the surface by washing them with solvent. When the parts are dry, the developer is brushed, sprayed or dipped on in a very thin coating.

Editor's Note:

Some of the inspection methods mentioned in this article were covered in earlier articles in *finish*, including the following: "A New Technique for Inspecting Metals" (dye penetrants), by Gilbert C. Close, western editor, December 1950; "Testing for Enamel Coating Discontinuities" by Stanley C. Orr, of The Pfaudler Company, July, 1952; and "Magnetic Particle Production Inspection", by Gilbert C. Close, western editor, March 1953. "A New Method for Locating Cracks in Ceramic Materials" by F. A. Petersen, U. of I., and Taber de Forest and Henry N. Staata, Magnaflux Corp., March 1948, FINISH.

Capillary attraction exerted by the developer will draw quantities of the red dye from any cracks or fissures existing in the metal. These will become readily apparent by contrast against the white background of the developer film, showing the location and extent of each defect.

Unlike fluorescent penetrants, when the dye penetrant indication is removed, the part will not show another indication of the defect without another treatment. Dye penetrants are exceptionally convenient for checking parts in use, such as aircraft propeller hubs and landing gear, without going to the trouble of disassembling them.

Because dye and fluorescent penetrants are similarly reliable for detecting the smallest blemishes and cracks in all types of metals, one or the other method is employed for examining components. Then, X-ray is used to reveal the hidden imperfections which lie below the surface.

Magnetic particle

If the parts are made from magnetic alloys, magnetic particle inspection is many times employed to find surface defects, rather than the penetrant methods, because it requires less time. This non-destructive technique is applicable to all sizes and shapes of parts. It possesses many production advantages because of its speed. Parts can be checked simply by dashing them in oil and examining them immediately without waiting for drying or processing periods. The method saves proportionately greater amounts of time when a large number of small parts are to be inspected because of the numerous manual operations which are eliminated.

For magnetic particle inspection, the parts are dipped or sprayed with a thin oil which contains iron oxide or other particles which will respond to a magnetic field. Then they are magnetized by either placing them in a solenoid, excited by an electric current, or passing a magnetizing current through them. In either case, finely divided iron oxide particles will adhere to any surface defect, showing its pattern and location.

This phenomenon is due to the fact that cracks, breaks or spaces in the metal structure present a pathway of reduced magnetic permeability which is less permeable than the surrounding metal. This causes the magnetic field generated to "bow out" and pass around the discontinuity. When the break extends to the surface, the magnetic lines of force "leak" out and form magnetic poles which attract the iron oxide particles. If the break lies just below the surface, some magnetic flux may still be deflected to the surface to provide a visible indication of the defect. If

to Page 83 →

Annealing cold rolled sheets to meet your exact specifications

Annealing Department of Cold Reduced Sheet Mill at our Indiana Harbor Works, East Chicago, Indiana.

Annealing is a fine art by Youngstown—done on modern equipment by men made expert by training and experience.

As a result, Youngstown cold rolled sheets and strip have just the right degree of annealing to meet customer requirements. They form fast and accurately, with fewer rejects and consequently lower fabrication costs.

Youngstown sheets start as top quality steel, are cold rolled to close tolerances, annealed and tempered to exact specifications, and tested and inspected at every step.

Phone our nearest District Sales Office whenever you need cold rolled sheets or strip.

QUALITY YOUNGSTOWN SERVICE

Youngstown

COLD ROLLED SHEETS AND STRIP

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

PAULSON TO WESTINGHOUSE REFRIGERATION POST

Appointment of C. W. Paulson as assistant to the manager of refrigeration specialties has been announced by H. F. Hildreth, manager of refrigeration specialties for the Westinghouse Electric Appliance Div., Mansfield, Ohio.

KAWNEER SALES FIGURES

Sales of Kawneer Co., Niles, Mich., for the second quarter of 1955 amounted to $7,131,000, compared with $6,709,000 during the first quarter, making a six months total of $13,840,000, 27% over the first six months of 1954.

FLORENCE STOVE 32% GAIN IN SALES AND PROFITS

Florence Stove Co. (Chicago) sales for the 28 weeks ended July 16 were up 32% over the same period last year, according to John P. Wright, chairman of the board. Sales were $16,921,931 compared to $12,860,645 last year.

RHEEM 6-MONTH EARNINGS

Rheem Mfg. Co.'s net earnings for the first 6 months of 1955 were $3,162,982, compared with $3,295,819 for the same period in 1954, it was announced by Richard S. Rheem, president.

ARMOUR RESEARCH APPT.

Orville T. Barnett has been promoted to assistant manager of the metals research department at Armour Research Foundation of Illinois Institute of Technology, Chicago.

BORG-WARNER 6-MO. FIGURES

Borg-Warner Corp.'s sales and earnings in the first half of 1955 were higher than any other 6-month period in the corporation's history. Sales were 37.4% over $194,729,331 in the first half of 1954, and earnings were 79% over $9,990,738 in 1954.

NEUMANN TO PERMUTIT

The Permutit Co., New York, N. Y., has announced the appointment of William C. Neumann as chemical research engineer in the special applications department.

NORGE ORDER DEPT. HEAD

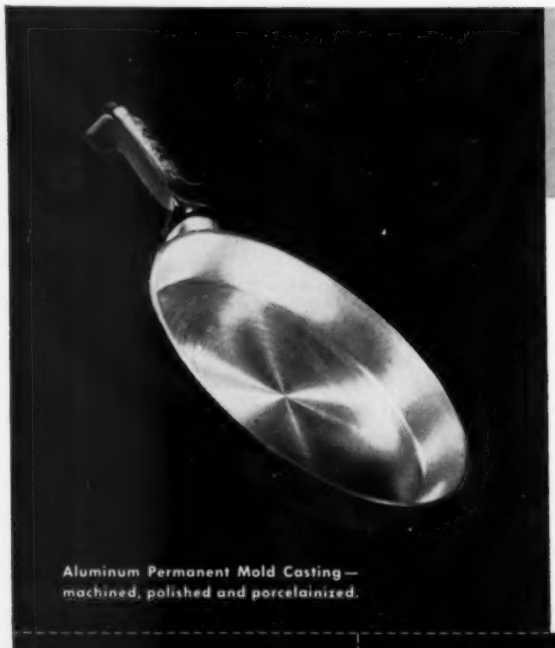
Appointment of Mead M. Messick as manager of the order department has been announced by Norge Div., Borg-Warner Corp., Chicago.

WESTINGHOUSE NAMES HUGO

Appointment of H. E. Hugo as southwestern regional manager for portable appliances has been announced by J. J. Anderson, manager of portable appliances for the Westinghouse Electric Appliance Div., Mansfield, Ohio.

VACUUM CLEANER SALES UP

Factory sales of standard-size household vacuum cleaners in June were highest for that month since 1950, and the half-year total was the


Aluminum Permanent Mold Casting—machined, polished and porcelainized.

When is a finished casting ...*finished?*

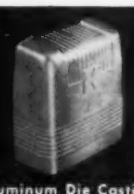
Monarch is the *only* light metal foundry offering a complete production package—7 services from casting to finishing—at one source. You achieve important savings, by eliminating lost time, multiple handling, overhead and numerous scheduling problems. When you buy finished castings or complete components, you'll find Monarch's one source—one responsibility pays in better end-products at lower end-cost.

MONARCH ALUMINUM MFG. COMPANY
9205 DETROIT AVENUE CLEVELAND 2, OHIO

MONARCH ALUMINUM

Aluminum Die Casting—machined and Velvaglazed®

Aluminum Permanent Mold Casting—Velvaglazed®


Aluminum Die Casting trimmed for painting

greatest since the second half of that year, according to the Vacuum Cleaner Manufacturers' Association.

June sales totalled 241,665 cleaners, up 23.4% from 195,781 in June, 1954, and down 7.5% from 261,238 in May.

The half-year total, 1,617,999, topped 1,322,796 in the same period last year by 22.3%.

KELVINATOR SALES UP

Kelvinator household appliance sales during July reached the second highest monthly total in four years, announced Homer L. Travis, general sales manager. Billings to dealers were 17.5% ahead of July, 1954, and billings for the 10 months of the fiscal year to date were 22.5% ahead of the same period a year ago.

KAWNEER NAMES STEVENS

Howard A. Stevens has been appointed director of business research for Kawneer Co., Niles, Mich., according to Henry W. Zimmer, executive vice president.

TAPPAN STOVE RETAINS DESIGN CONSULTANT FIRM

The industrial design firm of Smith, Scherr & McDermott, Akron, Ohio, announced that they have been retained as design consultants by the Tappan Stove Co., Mansfield, Ohio.

CARRIER APPOINTS TRITTEN TO WEST COAST POST

Ray A. Tritten has been appointed assistant to the general manager of the West Coast divisions of Carrier Corp., Syracuse, N. Y., it was announced by Lyle C. Harvey, senior vice president.

WESTINGHOUSE SALES AND EARNINGS RISE

Net income of the Westinghouse Electric Corp., Pittsburgh, in the second quarter of 1955 increased 30% over the first quarter of this year, president Gwilym A. Price, has reported. Net sales billed for the June, 1955 quarter totalled $388,258,000 compared with $367,705,000 in the first quarter of this year and $405,172,000 in the second quarter of 1954.

ADMIRAL 6-MONTH FIGURES

Consolidated sales of Admiral Corporation, Chicago, in the first six months of 1955 were $94,018,923, it was announced by John B. Huarisa, executive vice president. Net earnings for the half year were $1,946,192.

CARRIER RESIDENTIAL SALES INCENTIVE PROGRAM

A sales incentive promotion for residential air conditioners has been launched by Carrier Corp., Syracuse, N.Y., announced William Lake, residential sales manager, Unitary Equipment Div.

Billed as "New Carriertown Addition — 1955", the sales contest is a followup to last year's "Operation Carriertown".

When is a semi-finished casting . . . *finished?*

When Monarch produces semi-finished castings for your subsequent operations, product end-requirements are carefully studied to help you achieve lowest end cost. Monarch's wide experience in complete finishing, underwrites your operations from the very first casting produced. Check this unique *"Value Analysis"* approach to *immediate savings* on present and potential products. Monarch's one-source experience saves for you—all the way down the line.

MONARCH ALUMINUM MFG. COMPANY
9205 DETROIT AVENUE CLEVELAND 2, OHIO

Zinc Die Castings plated and assembled by customer

Aluminum Permanent Mold Casting—rough trimmed

Aluminum Die Casting—rough trimmed

Zinc Die Casting—trimmed for plating

MONARCH ALUMINUM

. . . or anything in-between . . .

ASSEMBLED PRODUCT

Follansbee's Sheet Metal Specialty Division is now equipped to produce from raw stamping to completely fabricated, finished, assembled and packaged product—even though the stamped metals are only a minor part of the completed job!

No matter what your requirements are or how intricate your specifications, Follansbee engineers will work with you in designing or redesigning your component parts. Complete tool room and die making facilities are available as well as one of the most modern finishing and assembling lines in the industry.

Call Follansbee engineers in early to discuss your stamping problems. A cost analysis on your job will be submitted without obligation.

SHEET METAL SPECIALTY DIVISION

FOLLANSBEE

STEEL CORPORATION

BOX 567 • FOLLANSBEE, WEST VIRGINIA

. . . small metal products

→ *from Page 72*

The main paint booth used in conjunction with the fab shop is located adjacent to it. It is a water wash spray booth with automatic conveyor system. It, and the electric oven, are located inside a fireproof concrete block room. Here fabricated drawers, vegetable units, circular shelves, flour and sugar sifters and the like are painted . . . some aluminum, some white. No primer. Just one coat.

Parts are hung on the continuous conveyor and are there tack rag wiped. Two painters spray the parts as they pass the booth, an average of 28 passes on some parts like metal drawers . . . and the painted parts pass on around to the unload side of the conveyor. About 1000 drawers (for instance) are painted in a day.

Paint is kept in 50 gallon drums alongside the booth. The drums are equipped with pumps. The paint goes through a paint heater (220° F) to the guns. It is a simple, clean paint area.

Painted parts are removed by a helper from the conveyor onto 8 by 10 foot rolling bake racks that hold from 180 to 260 parts and pushed into the oven where they are baked at 250° F for 35 minutes. The racks are then rolled out of the oven and through the out door of the paint room into packaging.

Demineralized water

→ *from Page 57*

sired purity is reached. During the regeneration cycle, the regenerative tanks are refilled with water so that fresh acid and caustic may be added in preparation for the next regeneration cycle.

Thus, the installation as employed for the General Electric refrigerator plant, in addition to providing conditioned and "controlled" water supply through the employment of ion exchange techniques, also provides the advantage of a completely automatic installation.

Inspection methods . . .

→ *from Page 78*

the discontinuity lies deeper, the flux may find a pathway within the metal without leaking through the surface, and no indication would occur.

All of these methods of inspection —X-ray, fluorescent and eye penetrants and magnetic particle — have two characteristics in common. They are non-destructive in effect, thus lending themselves to the examination of finely finished parts. And, they are employed to detect defects or foreign materials existing in the metal structure or placed there by fabrication processes.

Ryan uses another interesting inspection device which does not fall into these categories. This method is spectroscopy, and it is supervised by the engineering laboratory. Spectroscopic examinations are employed to determine the formulae of the metals which are received for production. While the method cannot be classed as non-destructive, the few grains of metal consumed by its use are a negligible amount.

Spectroscopy

Metal samples from stocks of raw materials are sent by the receiving department to the engineering laboratory for spectroscopic analysis. Similarly, parts which vendors supply are checked to determine that their formulae meet the engineering specifications.

A tiny sample of metal or a complete part may be analyzed with the spectrograph. This useful machine generates an electric spark between two carbon electrodes which vaporizes a very small amount of metal tested. As the metal incandesces, the light emitted is passed through a slit, to limit its height and width, and directed to a diffraction grating. This is a polished concave surface upon which are ruled 48,000 parallel lines within two inches. The grating reflects the light to a strip of film, breaking it into its various wave lengths like a prism does.

The light exposes the film in a series of light and dark bands, depending upon the wave lengths present. This picture, called a spectrogram, is taken to a densitometer and viewed in magnified proportions on a ground glass screen. Here, the pattern is checked against a standard which indicates which light waves are present. By comparisons with master spectra, it is possible to tell exactly which elements are present in the original metal sample. Often, traces as small as 1/1000th of one percent are detected, which could not be disclosed by other means. By comparing the intensities of the spectrum bands with standards it is also possible to make a good determination of the amounts of each element present. If exact amounts are required, a further examination of the sample is made through wet chemical methods which provide exact quantitative analysis.

X-ray metallography

Although X-rays were discovered

to Page 84 →

Unequaled in appearance, wear resistance and performance, Vitro chalkboard colors give a superior writing surface that lasts longer without glossing. They can be economically fired at low temperatures without metal warpage . . . provide greater coverage . . . and assure easier gloss control.

Available in blacks, yellows, whites, greens—also in pastel shades to take water soluble wax crayons.

Colors by Vitro

VITRO MANUFACTURING COMPANY
60 Greenway Drive, Pittsburgh 4, Pa.
A DIVISION OF VITRO CORPORATION OF AMERICA

NEWCOMB-DETROIT

PIONEERS IN ENGINEERING, MANUFACTURING & INSTALLING OF

INDUSTRIAL OVENS
•
SPRAY BOOTHS
•
PARTS WASHERS
•
DUST COLLECTORS
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HEAT and AIR SYSTEMS

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For Bulletins and Quotations, Wire, Write or Call—
NEWCOMB-DETROIT
5771 Russell Street
Detroit 11, Michigan
TR 3-2100

Inspection methods . . .

→ *from Page 83*

in 1895, their true nature was not known for many years. As they have become better understood, they have opened new vistas of approach for metallurgists. Previously, the principal tools for metallurgy were the microscope and spectrograph. Both depend upon the optical properties of visible light and have a resolving power limited by the wave length of light.

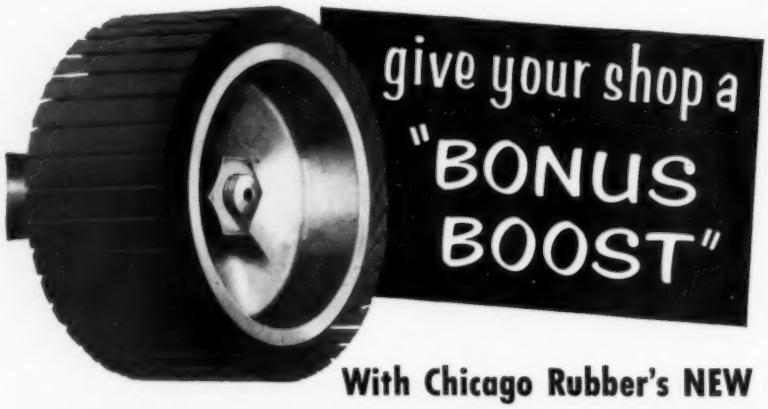
X-rays, with much shorter wave lengths, offered a new potential but could not be harnessed for probing matter because of the lack of a suitable diffractive mechanism. Optical diffraction gratings had spacings which were much too wide, yet were as fine as human hands could make them. Then, the idea of using the actual spaces between the atoms in a solid body was conceived.

It had been known that atoms in solid bodies were arranged in neat crystalline patterns with spacings that were close to the wave lengths of X-rays. Experiments were conducted in which X-rays were projected through crystals and directed to photographic plates. They were eminently successful in showing that X-rays could be diffracted by this means and also in substantiating that atoms were arrayed in precise space lattices. The diffracted X-rays bounced off the crystals in a definite direction and intensity which could be measured by the proper instruments.

From these investigations, X-ray metallography has been born. Metallurgists can now examine crystalline bodies with diffracted X-rays and tell a great deal about their physical structure and molecular architecture. For instance, it is possible to determine whether the crystals are cubic, hexagonal or tetrahexagonal, whether heat treatment has caused structural changes and whether more than one phase is present.

By bombarding a metal sample with X-rays of specific wave length, a fluorescent spectrum will be emitted by the test sample. Each wave length in the spectrum corresponds to an element in the sample, just as it did when light waves were used with the optical spectrograph. Intensity of the wave lengths can be measured by a Geiger counter to determine the amounts of the elements present.

With a resolving power of several hundred times that of light waves, X-rays are giving the metallurgist new fundamental knowledge of matter which the microscope is incapable of divulging.



With Chicago Rubber's NEW

COSMO EXPANDER WHEEL

You'll get faster grinding • Better work
Longer belt life • Easier trouble-free performance
Instant abrasive change • No down time

Cosmo Expanders up to 2" diameters available with ¼" mandrels for hand tools. Larger sizes up to 8" diameters—arbor hole type only. Specials to your specifications.

This brand new slotted rubber Cosmo Expander wheel cuts down high shop costs and valuable time. It's easier to operate and will allow you to get all the usable life out of your abrasive bands and sleeves. To change bands—no tools necessary. Slip it on and the centrifugal force exerted by this wheel holds the abrasive element tightly with no possibility of slipping—replacement becomes a matter of seconds. And what's most important, you will instantly notice a vast improvement in quality—the higher degree of resiliency in the Cosmo Expander will give you the best work you've ever done. You can't miss. Write for descriptive literature today.

"REMEMBER, IT'S THE WHEEL THAT DOES THE WORK"

CHICAGO RUBBER COMPANY, INC.

2620 CLYBOURN AVE. • CHICAGO 14, ILLINOIS

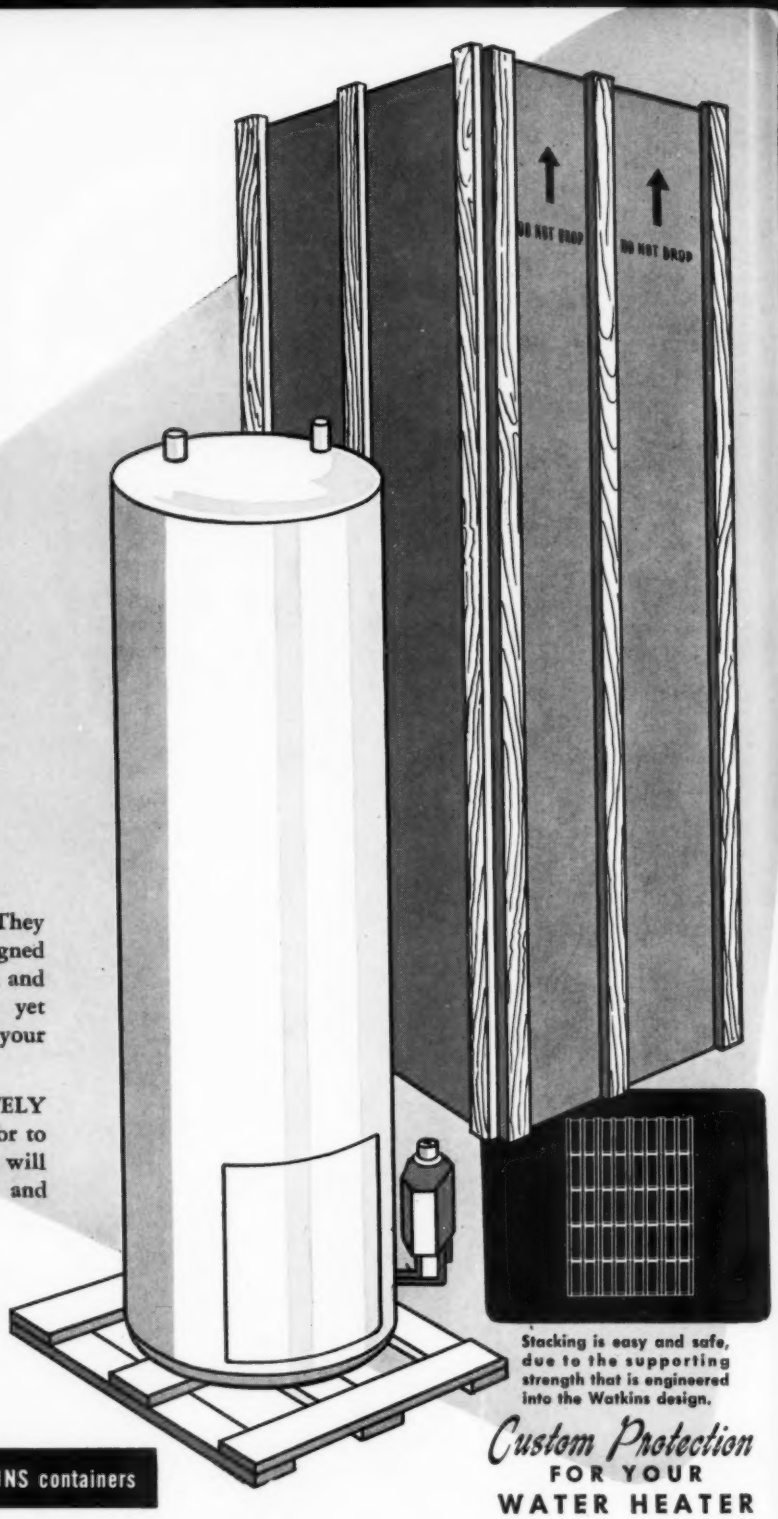
SOLAR STEEL EXECUTIVES ACQUIRE PRECISION STEEL

Precision Steel Corp., Bridgeport, Conn., has been acquired by 3 officials of the Solar Steel Corp., Sol H. Friedman, Daniel A. Friedman and J. B. Ribakoff.

Sol H. Friedman, Solar Steel president, will assume the duties of president of Precision Steel. D. A. Friedman and Ribakoff, vice presidents of Solar Steel, will be administrative vice presidents of Precision Steel.

sate transit

WATKINS has the container for your shipping problem



Stacking is easy and safe, due to the supporting strength that is engineered into the Watkins design.

Watkins Containers will cut your shipping costs. They are delivered to your factory 75% assembled and designed for quick and easy completion, to save you labor, time, and expense. Scientific design gives maximum strength, yet keeps container weight at a minimum and reduces your shipping costs.

In a Watkins Container your product is COMPLETELY protected enclosed 100% by a smooth, staple-free interior to safeguard fine finishes and to keep out dust and dirt. It will carry safely, you can stack to any practical height, and resistance to "weaving" and shock is assured.

Only Watkins Containers provide all of these many desirable and necessary features and at no greater cost than other types of containers. Ship your carefully manufactured products safely and economically—ship them the "Watkins Way."

Custom Protection
FOR YOUR
WATER HEATER

these companies build WATKINS containers

Cozier Container Corp......446 East 131st Street, Cleveland, Ohio
Crate-Rite Mfg. Co......1015 Orient Street, Oakland 7, California
Dura-Crates, Inc......940 East Michigan Street, Indianapolis, Indiana
General Box Co......1825 Miner St. Des Plaines, Illinois and 16th and Maple Sts., Louisville, Kentucky
Hemb & Martin Mfg. Co......P. O. Box 108, Murfreesboro, Tennessee
Illinois Box & Crate Co......811 Center Street, Plainfield, Illinois
Kieckhefer Box & Lumber Co...1711 West Canal Street, Milwaukee, 3 Wis.
Lane Container Corp......10212 Denton Road, Dallas, Texas
Lewisburg Container Co......243 Singer Street, Lewisburg, Ohio
Livingston Wood Manufacturing, Ltd......Tillsonburg, Ontario, Canada
Love Mfg., Inc...... 608 South Commerce Street, Wichita, Kansas
Pennsylvania Box & Lumber Co......Terwood Road, Willow Grove, Pa.
Utility Crate Corporation.....1985 E. 16th Street ,Los Angeles 21, Calif.

—an inquiry to any of these companies will get prompt attention

The · WATKINS CONTAINER · Manufacturers

safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and metal products manufacturing field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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DANA CHASE PUBLICATIONS

York St. at Park Ave.
Elmhurst, Illinois
PRINTED IN U.S.A.

Hot and humid weather — *in Chicago during August brought a clamor for dehumidifiers which depleted Polk Brothers' stock of the appliances. A rush order from Polk's to the Westinghouse plant in Springfield, Mass., had 50 dehumidifiers on the way to Chicago by air in less than 24 hours. The dehumidifiers were turned over to American Airlines the same day they were manufactured. The next morning they were delivered to Polk Brothers, and by the evening of the second day they were removing moisture from customers' homes.*

PHOTOS COURTESY GAYLORD CONTAINER CORPORATION

Household water pumps — *are being shipped from the Fairbanks Morse (Westco) plant in St. Louis in a new container which is reported to effect economies in materials handling, warehousing and shipping. The first packaging operation is placing the three-gallon tank pumps on a solid fibre base before going through the paint spray room. Next they are bolted to the container base. Then a specially-treated paper sheet is placed over the tank top to protect the finish. This sheet is held in position (left) by a die-cut "sunburst" opening which is part of the top lid. A small box containing parts and an envelope of instructions is attached to this tray. Final packaging operation (right) is to slip the pre-packaged pump assembly into the shipping container which is held in position by a wooden jig. Closure is accomplished by stapling.*

HERE'S THE MODERN WAY TO PACKAGE STOVES... CORRUGATED ALL THE WAY!

NEW International shipping container for Sears Roebuck's 30-inch KENMORE range eliminates wood skids... saves ⅓ packing time!

Cutaway container with top lifted up and back, shows the all corrugated packaging which assures safe transit.

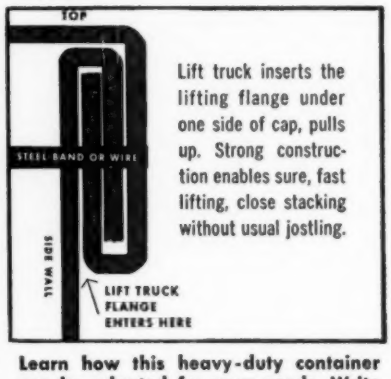
1. No bolts, no screws, no wood; the all corrugated skids are fastened to the container bottom, which is put in position at the beginning of the assembly line.

2. The stoves travel the entire length of the line on the corrugated base. The all corrugated construction eliminates occupational hazards.

3. Before exterior panels are assembled a special corrugated center guide (not shown) is raised to hold the range firmly in place.

4. The all corrugated container assures factory fresh arrival and eliminates the need for re-polishing, re-cleaning.

5. International's tube and cap design enables the lift-truck to handle more than one range at a time. (See design at right.)



Lift truck inserts the lifting flange under one side of cap, pulls up. Strong construction enables sure, fast lifting, close stacking without usual jostling.

Learn how this heavy-duty container can be adapted for your needs. Write us for further information.

International Paper company
CONTAINER DIVISION
220 East 42nd Street, New York 17, N. Y.

SIGNODE Strapping Station Handles Interlocking Flange Containers—2 a Minute

Here is high-speed, conveyorized production line packaging equipment that enables two men to fold, hold and strap *two* complete interlocking flange containers per minute . . . 120 an hour!

S-75 handles containers up to 41" x 50"

This conveyorized strapping station can handle containers ranging in width from 18" to 41" . . . and in length from 18" to 50". Adjustment for width is made in a matter of seconds. Adjustment for length is provided automatically by a set of five spring-loaded stops.

Offers new ways to cut costs

The S-75 Strapping Station breaks the bottleneck that formerly restricted the use of interlocking flange containers, and the savings in strapping time, strap used, manpower and handling time alone will quickly pay for this low-cost, profitable conveyorized strapping installation. For complete information write:

SIGNODE
STEEL STRAPPING COMPANY
2639 N. Western Ave., Chicago 47, Ill.

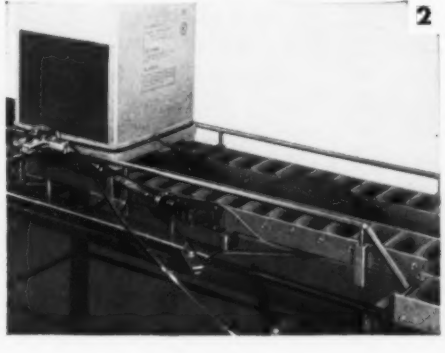
THIS SEAL MEANS SIGNODE SECURITY IN SHIPPING

In Canada: Canadian Steel Strapping Co., Ltd., Montreal, Toronto
Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide

(1 & 2) Rails hold folded side flaps. The forward stop (photo #1) holds front flap. Spring-loaded stops (photo #2) rise automatically as container passes over them to hold rear flap. Steel strapping is passed around the container, and is tensioned and sealed by a Signode sealfeed strapping machine. A special tool mount and balance arm hold the machine at the right level for strapping. When the machine is depressed it is disengaged and the front stop is released, so the container can move on down the line to the next position.

(3) Top cap is folded and held in position by a simple jig. Strapping tool, suspended from a spring balancer, tensions and seals the draped strapping.

1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3

Packing business machines for export

use of rubber shock mounts helps National Cash Register cut shipping weight and other packaging costs

TAKE an intricate and delicately adjusted machine costing several thousand dollars, and consigned for export shipment, and you're confronted with the problem of providing adequate packaging to withstand rough handling often met in export shipment.

National Cash Register Company, of Dayton, Ohio, was faced with just such a problem with one class of accounting machines priced from $2750 to $6500.

The machines, made in four different models, were shipped at first in very heavy and complicated containers. Each comprised an outer wood box and an inner wood box with three inches of excelsior between them. The machine was bolted to a heavy timber that was slid into the inner box.

Above: An accounting machine has just been wheeled from the assembly deparment to the packaging table at National Cash Register's plant in Dayton, Ohio.

Despite the two heavy containers and the excelsior, three out of five units in the first export shipment reached destination with the machine bases broken and other damage to delicate parts.

Shock mounts enter the picture

The next package tested was another wood box made of 1⅛" lum-

e accounting machine is lifted from the carriage upon which it s assembled and is lowered upon the special shipping base. The s of the machine fit into metal holders bolted to the wood cradle.

With the machine fitted into place on the special interior packing, and floating on rubber shock mounts, the pre-formed container hood with one side open is slipped over it.

ber, plus a heavy timber base featuring bonded rubber shock mounts. While the shock mounts provided adequate cushioning, the shipping weight of 600 pounds was termed uneconomical.

Shipping container engineers then collaborated with E. H. Voehringer, NCR traffic manager, M. W. Barnell, assistant chief inspector, and other NCR personnel to design the present shipping container which is more economical in cost and lighter in weight, yet fully protective.

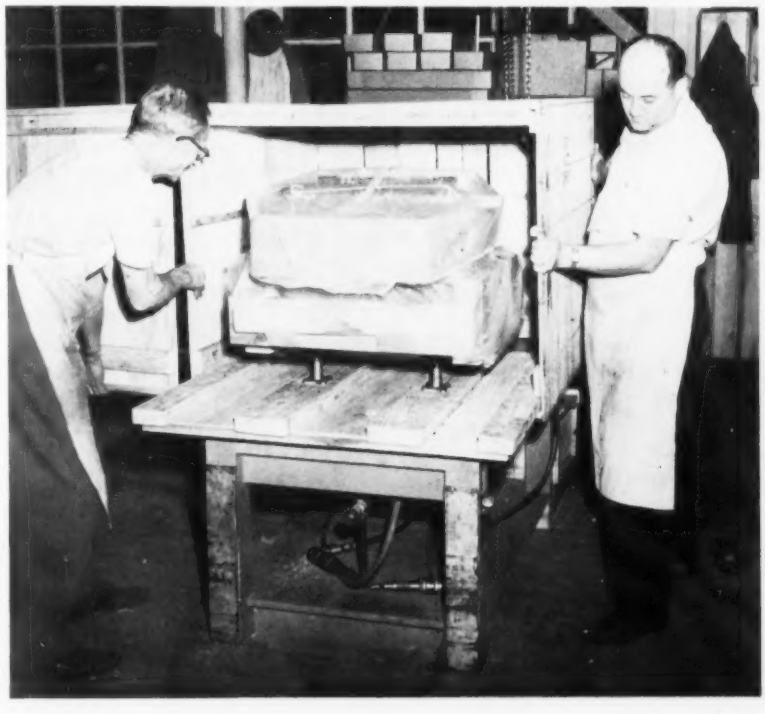
NCR accounting machines are still mounted on the rubber shock mounts attached to a sturdy base which is actually the base of the box. When a machine is securely in place on the rubber shock mounts, it is packed for shipment simply by enclosing the machine with a transparent plastic bag, and covering it with a hood consisting of the top of the box and a one-piece wirebound blank that comprises the four sides.

45% reduction in packing time

The bases of all four models of the accounting machines are the same and all machines have the same width, so that the same shipping base and box can be used for all models. Shipping weight was reduced from over 600 pounds to 466 pounds, and where formerly it took 125 minutes to pack an accounting machine, it now takes only 69 minutes.

This same container won second prize in the export classification of last year's National Protective Packaging and Materials Handling Competition. It was entered in the competition by M. W. Barnell, NCR assistant chief inspector.

The protective hood formed by the top of the box and the one-piece wrap-around blank that comprises the four sides of the box are placed in position by sliding the unit forward so that its bottom and cleats snugly engage the sturdy bottom of the box.



"General's ten factories assure <u>your</u> plants of better container service and lower costs"

Prompt and economical delivery of the containers you order is an important part of the regular service offered by General Box Company. Factories are located in or near the nation's major producing centers. The duplicate production facilities these 10 modern plants contain assure on-time delivery tuned to your needs even under unusual circumstances.

A second important service advantage General Box offers you is access to some of the finest container design and testing facilities in the industry.

Find out the dollars-and-cents advantage to you of this national container service—dependable delivery from the General Box factory near you of containers custom-engineered for your products. Let us send a man to give you the facts. No obligation. Ask, too, for your free copy of the informative booklet, "General Box."

Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

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★ ★ ★ ★ ★

shipping damage in summer being almost double that in the winter, the National Safe Transit Committee is working hard on a project for . . .

Combatting the seasonal trend in shipping damage

ONE of the most baffling problems encountered by the National Safe Transit Committee in its never-ending battle to reduce handling and shipping losses to packaged products is concerned with the seasonal trend in shipping damage.

Extensive research work by NST over a 5½-year period shows that shipping damage during the summer months is almost double that during winter months.

The accompanying "seasonal trend" chart represents a typical cross-section of major appliances and other metal products received at their destination in a damaged condition.

Editor's Note:

While the accompanying chart covers approximately a year more of research than a similar one published in the December 1954 issue of *finish*, it indicates little change in the seasonal trend in shipping damage.

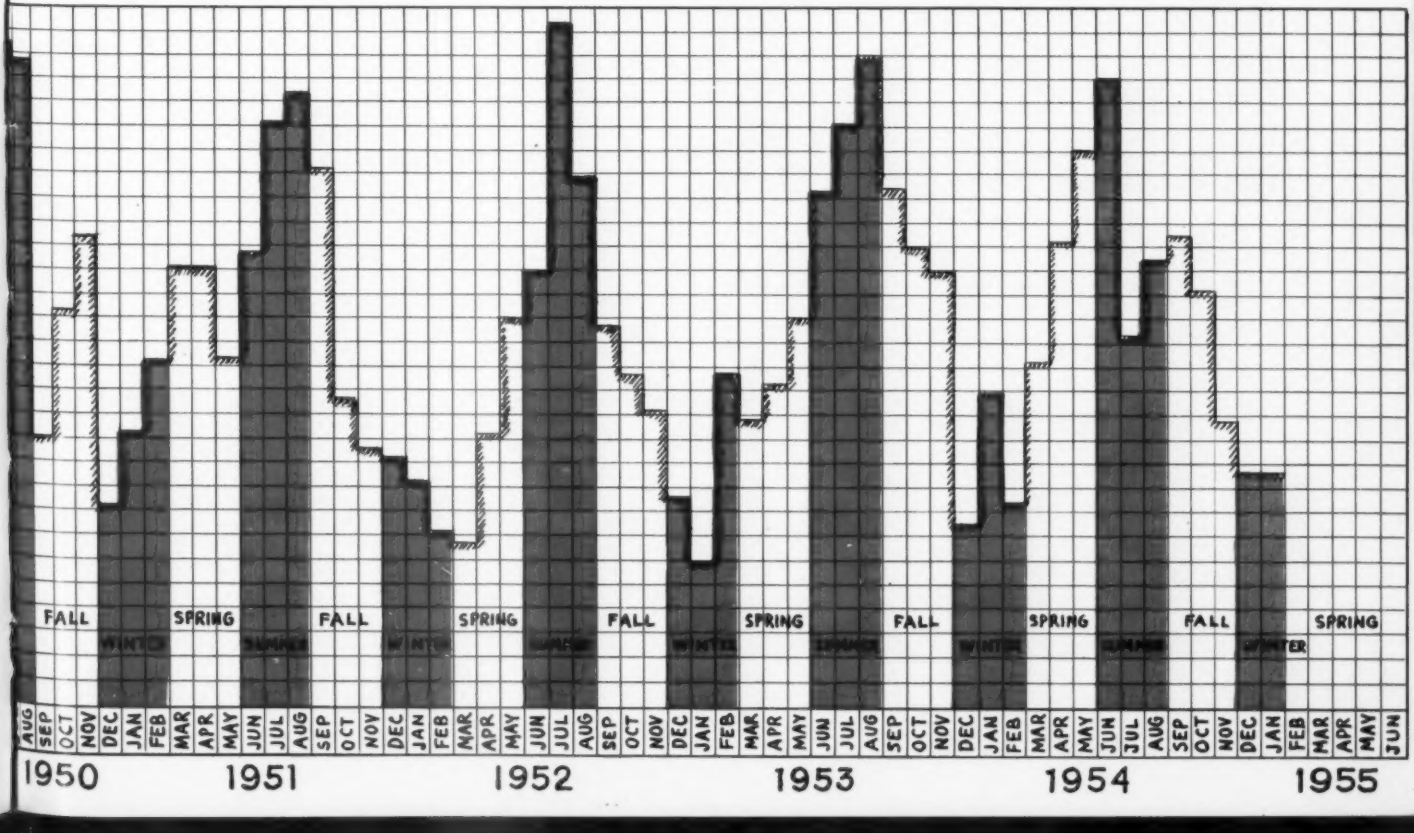
It would therefore seem imperative that all persons concerned with the safe shipment of packaged products be alerted throughout the entire year on the importance of proper packaging and handling.

The chart was plotted by determining the per cent of products reported received in a damaged condition in relation to the total quantity reported received in shipments, with each month's recording representing an average of 75,000 major units.

The reports cover shipments by every type of common carrier to all points in the 48 states, thus providing a cross-section of climatic and geographical conditions.

The National Safe Transit Committee believes that the seasonal trend represents all kinds of packaged products that are shipped by common carrier. The results shown by the chart "are further substantiated by the increasing correlation data we are receiving each month on various other products," reports Ralph F. Bis-

This chart shows an almost unbelievable trend of damage in summer months almost double that of winter months.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1954
1955

bee, general chairman, National Safe Transit Committee.

Factors involved

The following probable causes have been compiled from information gathered to date:

Faster speeds in summer — Hot cars increase railroad switching impacts, with a "hot" car defined as one taken from a train just arrived from a long run, while a "cold" car is one that has been standing in the yards for a considerable time. Also, the speeds of trucks and trains are considerably accelerated during the good weather in summer months compared with winter months.

Vacations — Inexperienced and part-time personnel during summer vacation months are not always aware of the importance of proper handling of packaged products.

Humidity—summer vs. winter — Tests conducted by the NST Technical Committee, together with representative laboratories and manufacturers, show that it takes far less vibration and impact to cause damage to containers during the high humidity months of summer than during the winter months. Tests also show that during summer it takes less weight to crush the container on the bottom of a stack in the warehouse or at the end of a car.

Effect of weather on men — According to physiologists, there is a greater likelihood for more carelessness, even with regular employees, in hot humid weather. This, added to the vacation employees, adds up to an important factor in heavier damage during the summer months.

The solution

The solution to this problem, according to the NST general chairman, is "for an even greater cooperative movement in training and educating personnel, right down to the line to the last man, in the proper ways of handling packaged products, whether these packaged products are single units, multiple units, truckloads or carloads."

CONTAINER LABORATORIES SETS UP WEST COAST UNIT

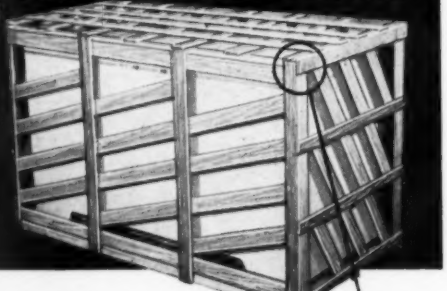
W. H. Vogan, manager, Pacific Coast Branch, American Gas Association Laboratories, Los Angeles, reports their National Safe Transit testing equipment has been sold to Container Laboratories, Inc., which has opened a laboratory in Los Angeles.

Charles J. Zusi, president of Container Laboratories, reported that their new laboratory "will be fully equipped for the performance of tests simulating the actual hazards of transportation of filled shipping containers, including those of the National Safe Transit Committee program."

In charge of the new laboratory is Henry D. Breen, who has had packaging experience with National Container Corporation of California and Hiller Helicopter Company.

Container Laboratories also has testing facilities in New York, Chicago and San Francisco.

BIGELOW-GARVEY'S SPECIALLY DESIGNED TIGHT-CORNER COLLAPSIBLE CRATES



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NEW YORK U. GENERAL EDUCATION DIV. ANNOUNCES EVENING PACKAGING COURSE

A new evening course in package engineering is being offered during the fall term this year by New York University's Division of General Education, it was announced by Dean Paul A. McGhee.

"Packaging Engineering: Protective Design Techniques and Cost Reduction Studies" is designed for persons with practical packaging, packing, and allied interests. Class meetings are being held from 6:15 to 8 p.m. on Tuesdays, September 27 through January 17.

Basic principles and rules for packaging will be reviewed and illustrated by case studies during the course. Two class sessions will be held at a nearby container evaluation laboratory, and one session will be devoted to a discussion of military packing techniques.

Co-instructors for the course are Allyn C. Beardsell, vice president of Container Laboratories, Inc., and Alfred W. Hoffman, quality control manager, container division, Robert Gair Company, Inc.

Further information may be obtained from the Division of General Education, New York University, 1 Washington Square North, New York City 3, New York.

CHICAGO MILL helps NORGE *Deliver Safely*

NORGE REFRIGERATORS ON THE PACKAGING LINE AT THE MUSKEGON HEIGHTS PLANT.

Norge Division, Borg-Warner Corporation, and many other leading appliance manufacturers depend upon Chicago Mill and Lumber Company to provide safe shipment for their finished products.

If you are having difficulty in solving a troublesome shipping problem, call in a Chicago Mill representative. Technical information, packing information, and testing services are available without obligation.

Wirebound
Nailed or Hinge Corner
Cleated Plywood
Cleated Craveneer
Cleated Corrugated
Watkins Type Containers
Shop and Tote Boxes
Woodsteel Nesting Boxes

★

FOR DOMESTIC OR EXPORT
FOR PEACE OR DEFENSE

A shipping container for every shipping purpose.

FOR SAFER TRANSIT BY • TRUCK • BOAT • TRAIN • PLANE

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33 South Clark Street — **Chicago 3, Illinois**

Plants at: Helena, Arkansas • Greenville, Mississippi • Rockmart, Georgia
Tallulah, Louisiana • South Fork, Colorado • Chicago, Illinois

Philco is solidly behind NST

PHILCO Corporation uses the NST pre-shipment testing procedure in each of its four major appliance division factories. The following is quoted from a message to the chairman of the NST Committee from J. Gardner Crowell, Philco packaging and crating engineer, Refrigeration & Range Engineering Division, Philadelphia:

"... *We believe that the Pre-Shipment Testing procedure established by the National Safe Transit Committee is proving to be the single factor of greatest importance in the continued reduction of damage due to handling at the shippers' factory, during transit by the carriers, and at distributor and dealer warehouses.*

"The NST program affords a voluntary means of standardization of pre-shipment testing of both product and shipping container that merits the wholehearted cooperation of the manufacturing and transportation industries and distribution agencies.

"The Philco Corporation has installed the recommended standard impact and vibration testing equipment at all four of our major Appliance Division factories. We had, as you know, used the Conbur tester and a vibration table in our Engineering Laboratories for many years prior to the inauguration of the National Safe Transit program. *They have proved of tremendous value to us in the elimination of weak points in the construction of both product and shipping container* and have helped greatly in *effecting cost reductions* that could be *made with safety. No new product or model, or shipping crate, or container is approved for production until it has been subjected to the standard NST pre-shipment tests.*

"Our experience of over a decade of pre-shipment testing has been invaluable to us, and *we are confident that a wider use of the NST program* and particularly by the appliance manufacturers *will bring real rewards in good will and dollars saved.*"

These remarks are typical of the enthusiasm shown by major appliance manufacturers for the helpfulness of the NST program.

* Note: Italics added by editor.

NST CERTIFICATIONS

A. J. Lindeman & Hoverson Company, Milwaukee, Wisc., was recently re-certified under the National Safe Transit Program. The Ohio Foundry & Mfg. Company, Steubenville, Ohio, is a new certification, which brings the total number of certified companies to 190. The certification of Cornell Paperboard Products Company, Milwaukee, Wisc., brings to a total of 41 the number of Safe Transit Laboratories.

J-8. Lightweight gravity wheel strip conveyor

New A new type of lightweight gravity wheel strip conveyor is now manufactured. It is available in two standard sizes, each with a choice of three wheel spacings for handling a wide range of materials. One feature is the method of wheel mounting to give two-point axle support that provides maximum resistance to bending under loads. A standard ten-foot section with supports on 5-foot centers has a distributed load capacity of from 400 to 750 pounds, weighs only 15 to 24 pounds for easy set-up and storage. It has a wide application for handling packages, cases, cartons, pallets, etc. inquiries should contain key number.

AIM* for new production ideas with Acme Steel Strapping

*Acme Idea Man Chuck Deerwester, Kalamazoo, Mich., is one of almost 100 men helping you solve shipping problems

ask your *Acme Idea Man to help solve your problems

Most people think of Acme Steel Strapping in terms of safer, lower-cost shipping. Whirlpool Corporation also employs it as a functional part of design and manufacture of its automatic clothes dryer.

Acme Steel Strapping secures a felt insulation strip and wire mesh screen to the back of the dryer drum (Idea No. S7-8). Without a perfect sealing action, hot air would escape and impair operation. Whirlpool reports that in five years no unit has been returned as defective!

Ask your Acme Idea Man for help in applying Acme Steel Strapping to your packaging, shipping and manufacturing problems. As a strapping specialist, his knowledge of other case histories may prove valuable. His analysis and recommendations are yours without obligation. Call him at your nearest Acme Steel office. Or write Dept. RS-105 for further information.

ACME STEEL PRODUCTS DIVISION

ACME STEEL COMPANY

2840 ARCHER AVENUE, CHICAGO 8, ILLINOIS • ACME STEEL CO. OF CANADA, LTD., TORONTO

ACME STEEL

191 Safe Transit Certifications

THE following companies are certified under the National Safe Transit Program.

Ace Utilities, Inc.
Brooklyn, New York

Ackermann Manufacturing Company
Wheeling, West Virginia

Active Tool & Manufacturing Co.
Detroit, Michigan

Admiral Corporation
Chicago, Illinois

AllianceWare, Inc.
Alliance, Ohio

Altorfer Bros. Company
Peoria, Illinois

Amana Refrigeration, Inc.
Amana, Iowa

American & Southern Corp.
Nashville, Tennessee

American Kitchens Division
Avco Manufacturing Corp.
Connersville, Indiana

Anchor Division
Stratton & Terstegge Co.
New Albany, Indiana

Andrew Corporation
Chicago, Illinois

Apex Electrical Manufacturing Co.
Cleveland, Ohio

Artkraft Manufacturing Company
Universal Major elec. Appliances, Inc.
Lima, Ohio

Automatic Washer Company
Newton, Iowa

Beam Manufacturing Company
Webster City, Iowa

Bee Line Company
Davenport, Iowa

The Belmont Company
Division of Ridge Tool Co.
New Philadelphia, Ohio

Ben-Hur Manufacturing Company
Milwaukee, Wisconsin

Berger Manufacturing Division
Republic Steel Corporation
Canton, Ohio

Boston Stove Foundry Company
Reading, Massachussets

Brown Stove Works, Inc.
Cleveland, Tennessee

Bryant Heater Division
Carrier Corporation
Indianapolis, Indiana

Bryant Heater Division
Carrier Corporation
Tyler, Texas

Calcinator Corporation
Bay City, Michigan

Caloric Appliance Corporation
Topton, Pennsylvania

Canadian General Electric Co., Ltd.
Montreal, Quebec

Canadian Westinghouse Company, Ltd.
Hamilton, Ontario

Central Rubber & Steel Corporation
Findlay, Ohio

Challenge Stamping & Porcelain Co.
Grand Haven, Michigan

Chambers Corporation
Shelbyville, Indiana

Chicago Electric Division
The Silex Company
Chicago, Illinois

Chicago Vitreous Corporation
Cicero, Illinois

Cincinnati Milling Products Division
Cincinnati Milling Machine Company
Cincinnati, Ohio

Clarostat Manufacturing Co., Inc.
Dover, New Hampshire

Consolidated Industries, Inc.
Lafayette, Indiana

Continental Water Heater Company
Los Angeles, California

Cribben & Sexton Company
Chicago, Illinois

Crosley-Bendix Division
Avco Manufacturing Corp.
Cincinnati, Ohio

Crosley-Bendix Division
Avco Manufacturing Corp.
Nashville, Tennessee

Crown Stove Works
Chicago, Illinois

Crunden Martin Manufacturing Co.
St. Louis, Missouri

Davis Products Company
Niles, Michigan

Day & Night Division
Carrier Corporation
Monrovia, California

Deepfreeze Appliance Division
Motor Products Corporation
North Chicago, Illinois

Detroit-Michigan Stove Company
Detroit, Michigan

Dexter Division
Philco Corporation
Fairfield, Iowa

Dixie Products, Inc.
Cleveland, Tennessee

The Dortch Stove Works, Inc.
Franklin, Tennessee

Dostal & Lowey Company, Inc.
Menomonee Falls, Wisconsin

Duo-Therm Division
Motor Wheel Corporation
Lansing, Michigan

Eagle Range & Manufacturing Co.
Belleville, Illinois

Easy Washing Machine Corporation
Syracuse, New York

The Enamel Products Company
Cleveland, Ohio

Fairbanks, Morse & Company
St. Johnsbury, Vermont

Fedders-Quigan Corporation
Buffalo, New York

Fedders-Quigan Corporation
Maspeth, Long Island, N.Y.

Federal Enameling & Stamping Co.
Pittsburgh, Pennsylvania

Firestone Steel Products Company
Akron, Ohio

Firestone Steel Products Company
Wyandotte, Michigan

The Fletcher Enamel Company
Dunbar, West Virginia

Florence Stove Company
Kankakee, Illinois

Florence Stove Company
Lewisburg, Tennessee

The Floyd-Wells Company
Royersford, Pennsylvania

Fogel Refrigerator Company
Philadelphia, Pennsylvania

Franklin Manufacturing Co., Inc.
Minneapolis, Minnesota

Fresh'nd-Aire Company
Division of Cory Corporation
Grayslake, Illinois

Frigidaire Division
General Motors Corporation
Dayton, Ohio

Gasinator Manufacturing Company
Cleveland, Ohio

General Electric Company
Bloomfield, New Jersey

General Electric Company
Erie, Pennsylvania

General Electric Company
Dishwasher & Disposal Dept.
Louisville, Kentucky

General Electric Company
Home Laundry Department
Louisville, Kentucky

General Electric Company
Household Refrigerator Dept.
Louisville, Kentucky

General Electric Company
Range & Water Heater Dept.
Louisville, Kentucky

General Electric Company
Room Air Conditioner Dept.
Louisville, Kentucky

Geneva Modern Kitchens
Div. of Acme Steel Company
Geneva, Illinois

Globe American Corporation
Kokomo, Indiana

Gray & Dudley Company
Nashville, Tennessee

Hardwick Stove Company, Inc.
Cleveland, Tennessee

Haskell Manufacturing Co., Inc.
Pittsburgh, Pennsylvania

Heintz Manufacturing Company
Philadelphia, Pennsylvania

Hotpoint Company
Chicago, Illinois

Humphryes Manufacturing Company
Mansfield, Ohio

Ingersoll Products Division
Borg-Warner Corporation
Chicago, Illinois

Ingram-Richardson, Inc.
Frankfort, Indiana

International Harvester Company
Evansville, Indiana

International Harvester Company
Richmond, Indiana

James, Inc.
Independence, Kansas

Jordon Refrigerator Company, Inc.
Philadelphia, Pennsylvania

Kaiser Metal Products, Inc.
Bristol, Pennsylvania

Kelvinator Division
American Motors Corporation
Grand Rapids, Michigan

Kresky Manufacturing Co., Inc.
Petaluma, California

Kuehne Manufacturing Company
Mattoon, Illinois

The Lennox Furnace Company
Marshalltown, Iowa

A. J. Lindemann & Hoverson Co.
Milwaukee, Wisconsin

Line Material Company
Division of McGraw Electric Co.
Milwaukee, Wisconsin

Lisk-Savory Corporation
Canandaigua, New York

Locke Stove Company
Kansas City, Missouri

Logan Engineering Company
Chicago, Illinois

Lovell Manufacturing Company
Erie, Pennsylvania

Luxra Company
Atchison, Kansas

McCray Refrigerator Company, Inc.
Kendallville, Indiana

A. Y. McDonald Manufacturing Co.
Dubuque, Iowa

Magic Chef, Inc.
St. Louis, Missouri

Magic Chef, Inc.
Cleveland, Ohio

Majestic Manufacturing Company
St. Louis, Missouri

Malleable Iron Range Company
Beaver Dam, Wisconsin

Malsbary Manufacturing Company
Oakland, California

Manitowoc Equipment Works
Manitowoc, Wisconsin

The Maytag Company
Newton, Iowa

Miami Products, Inc.
Miami, Oklahoma

Midwest Manufacturing Company
Division of Admiral Corporation
Galesburg, Illinois

Moffats, Limited
Weston, Ontario

The Moore Enameling & Mfg. Co.
West Lafayette, Ohio

Mt. Vernon Furnace & Mfg. Co.
Mt. Vernon, Illinois

Murray Corporation of America
Scranton, Pennsylvania

Murray Manufacturing Company
Murray, Kentucky

Neon Products, Inc.
Lima, Ohio

Nesco, Inc.
Jacksonville, Illinois

Newark Stove Company
Newark, Ohio

Norge Division
Borg-Warner Corporation
Effingham, Illinois

Norge Division
Borg-Warner Corporation
Herrin, Illinois

Norge Division
Borg-Warner Corporation
Muskegon Heights, Michigan

The C. A. Olsen Manufacturing Co.
Elyria, Ohio

Payne Furnace Division
Carrier Corporation
Monrovia, California

Peerless Manufacturing Corporation
Louisville, Kentucky

Perfection Stove Company
Cleveland, Ohio

Philco Corporation
Philadelphia, Pennsylvania

Philco Corporation
Mt. Clemens, Michigan

Porcelain Metals Corp. of Louisville
Louisville, Kentucky

Precision Grinding Wheel Co., Inc.
Philadelphia, Pennsylvania

Preway, Inc.
Wisconsin Rapids, Wisconsin

Quicfrez, Inc.
Fond du Lac, Wisconsin

Quincy Stove Manufacturing Co.
Quincy, Illinois

Ranney Refrigerator Company
Greenville, Michigan

Raytheon Manufacturing Company
Brighton, Massachusetts

Raytheon Manufacturing Company
Waltham, Massachusetts

Reda Pump Company
Bartlesville, Oklahoma

Remington Corporation
Auburn, New York

Revco, Inc.
Deerfield, Michigan

Reznor Manufacturing Company
Mercer, Pennsylvania

Rheem Manufacturing Company
Chicago, Illinois

Geo. D. Roper Corporation
Rockford, Illinois

Rowe Spacarb, Inc.
Stamford, Connecticut

Milton Roy Company
Philadelphia, Pennsylvania

Royal Typewriter Company, Inc.
Hartford, Connecticut

Ruud Manufacturing Company
Kalamazoo, Michigan

Samuel Stamping & Enameling Co.
Chattanooga, Tennessee

Seeger Refrigerator Company
St. Paul, Minnesota

Seeger Refrigerator Company
Evansville, Indiana

Servel, Inc.
Evansville, Indiana

Shampaine Company
St. Louis, Missouri

The Siegler Corporation
Centralia, Illinois

Simonds Abrasive Company
Philadelphia, Pennsylvania

Simonds Worden White Company
Dayton, Ohio

A. O. Smith Corporation
Kankakee, Illinois

Speed Queen Corporation
Algonquin, Illinois

State Stove & Manufacturing Co.
Nashville, Tennessee

Stewart-Warner Corporation
Indianapolis, Indiana

Stolper Steel Products Corp.
Menomonee Falls, Wisconsin

The Sunray Stove Company
Delaware, Ohio

The O. A. Sutton Corporation
Wichita, Kansas

Sylvania Electric Products, Inc.
Buffalo, New York

Sylvania Electric (Canada), Ltd.
Dunville, Ontario

Tappan Stove Company
Mansfield, Ohio

Temco, Inc.
Nashville, Tennessee

Tennessee Stove Works
Chattanooga, Tennessee

Thor Corporation
Chicago, Illinois

Thor Corporation
Meadows Division
Bloomington, Illinois

Toledo Porcelain Enamel Products Co.
Toledo, Ohio

United Specialties Company
Philadelphia, Pennsylvania

United States Rubber Company
Fort Wayne, Indiana

United States Stamping Company
Moundsville, West Virginia

Universal Major Elec. Appliances, Inc.
Baltimore, Maryland

Victor Products Corporation
Hagerstown, Maryland

Victory Metal Manufacturing Corp.
Plymouth Meeting, Pennsylvania

Welbilt Stove Company, Inc.
Maspeth, Long Island, N. Y.

Westinghouse Electric Corporation
East Pittsburgh, Pennsylvania

Westinghouse Electric Corporation
East Springfield, Massachusetts

Westinghouse Electric Corporation
Metuchen, New Jersey

Westinghouse Electric Corporation
Raleigh, North Carolina

Westinghouse Electric Corporation
Columbus, Ohio

Westinghouse Electric Corporation
Mansfield, Ohio

Westinghouse Electric Corporation
Beaver, Pennsylvania

Westinghouse Electric Corporation
Sharon, Pennsylvania

Westinghouse Electric Corporation
Pittsburgh, Pennsylvania

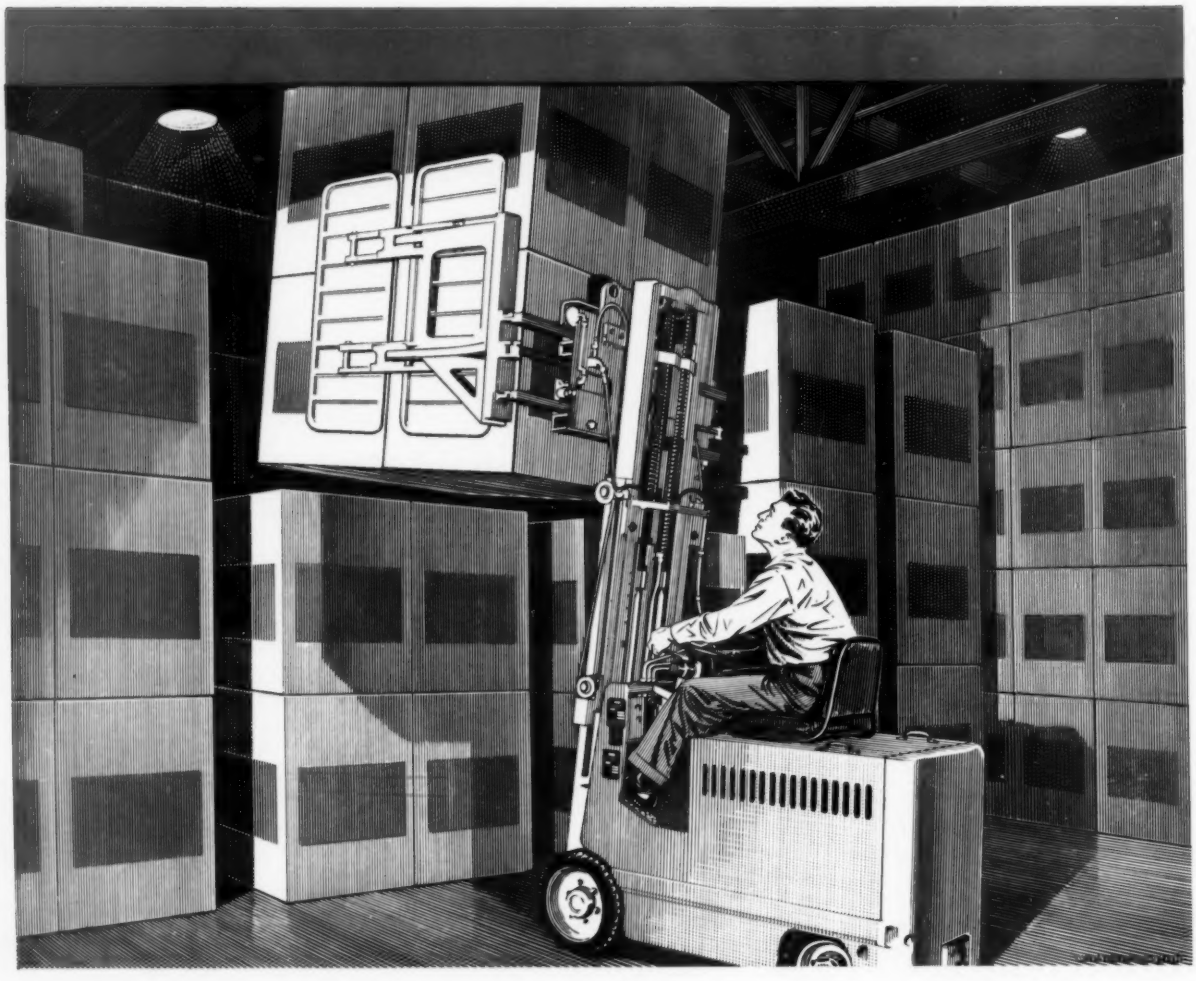
Whirlpool Corporation
Clyde, Ohio

The S. S. White Dental Mfg. Co.
Staten Island, New York

John Wood Company
Chicago, Illinois

John Wood Company
Conshohocken, Pennsylvania

York Corporation
York, Pennsylvania



THE SQUEEZE-PLAY IS ON

Gaylord Boxes

Rising costs are putting the squeeze on profits. One place to cut costs may be in your product packaging. A modern Gaylord corrugated box can speed packing, improve handling efficiency, reduce shipping costs and enhance customer appeal.

For up-to-the-minute information on the latest packing developments in your field, contact your nearby Gaylord office.

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES • KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

SALES OFFICES FROM COAST TO COAST ★ CONSULT YOUR LOCAL PHONE BOOK

ST-16

The Indian sang his death song

100 YEARS AGO, during a frontier skirmish, an Indian brave, singing his own death song, charged down on a young officer.

Lieutenant George Crook, 4th Infantry, coolly fell to one knee, carefully aimed, and dropped the brave in his tracks.

It was not Crook's first Indian, nor his last. (His right leg already contained a flint arrowhead he was to carry to his grave.) And by the time he made general, Crook was the greatest Indian-fighter this country has ever had.

Yet, he was also one of the best friends the Indians have ever had. For he understood them well, dealt fairly and firmly, and always kept his promises.

When Crook died, Indians wept. And a Sioux chief named Red Cloud said: "He never lied to us. His words gave the people hope."

No nation can ever have enough men like George Crook. But America had, and still has, a lot of them. That's important to remember. Because it is a wealth of human character rather than a wealth of money that gives America its real worth. Just as it is the Americans, all 160 million of them, standing behind our country's Savings Bonds, who make these Bonds one of the world's finest investments.

For your sake—and America's—why not take advantage of this fact? Invest in, and hold, United States Savings Bonds.

* * *

It's actually easy to save money—when you buy United States Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done *for* you. And the Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, for as long as 19 years and 8 months if you wish! Sign up today! Or, if you're self-employed, invest in Bonds regularly where you bank.

Safe as America – U.S. Savings Bonds

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New Supplies and Equipment

J-1. Permanent marking ink

New A fast-drying, permanent marking ink in an improved, handy package-aplicator is being offered. The marking ink will not readily chip, peel or be affected by heat or weathering, and it is packaged in a burst-proof tube fitted with a smooth acting ball point. The improved package affords an easy-to-use marking implement for making identifying marks on rough or smooth surfaces such as castings, bar stock, machinery, tools, dies, and is also suitable for use on glass, wood or plastics. Different size ball points and seven standard colors are available.

J-2. New zinc chromate stripper

New Stripper No. 110, designed to remove zinc chromate primers from aluminum without affecting the metal surface, has been introduced. A two-phase solvent material, it is used full strength. The part to be stripped is immersed completely in the solvent, under the surface oil seal, which should be maintained continuously. According to the manufacturers, the material will remove zinc chromate primers and other finishes from aluminum with complete safety when used as recommended.

J-3. New Poly-Amide epoxy finish

New This new finish can be applied directly to any clean metal surface without a prime coat, has exceptional adhesive qualities, has an extremely hard surface, yet is flexible and will not crack or chip under impact or bending and may be applied by brush, spray, applicator or dipping, according to the manufacturer.

It is a two component finish that is mixed in equal parts as required. When mixed it has a very low viscosity which is maintained in the container for several hours with little change, yet when applied it air dries dust free in thirty minutes and can be handled in 120 minutes. It is available in clear and colors.

More Information

For more information on new supplies, equipment and literature reviewed here, fill out the order form, or write to us on your company stationery.

J-4. Aluminum sealer

New Luster-On aluminum sealer produces a chromate film on aluminum that provides corrosion protection and can serve as a paint base. The new sealer replaces anodizing where hardness is not a prime factor. It is easily applied in one dip at room temperatures; it is said to adhere well and does not leach easily. It can be dyed in many pastel colors.

J-5. Aluminum foil nameplates

New Aluminum foil laminated to a layer of improved bonding material makes a new type of metal nameplates. The anodized surface of the aluminum foil is printed in most any standard color with a size and shape to answer practically any nameplate need. They are especially suitable for circuit diagrams, terminal designations, trademarks, property tags, and many similar uses because they are permanent, inexpensive, quickly applied and government approved.

J-6. New spray gun

New This new lightweight spray gun with its overhead trigger is said to be ideal for all types of touch-up work and shading. In this new model the air line connection is at the back of the gun. This has two major advantages: It puts the weight of the hose on the arm where it can be easily suported. Operation of the gun for delicate shading or touch-up is more precise without the dangling hose. Also, it is easier to reach into corners or awkward spots without having the hose in the way. The 4-ounce glass siphon cup which makes it economical to apply small quantities of finish is new too.

J-7. "Krome-On" addition agent

New A new liquid addition agent called "Krome-On", according to performance data reported by platers using the additive, can materially increase the throwing power of chromium plating baths. It furnishes a superior mist-inhibiting blanket to reduce spray and flue loss, thereby saving chromic acid waste.

J-9. Electric metal shears

New Powered by a universal-type motor, the electric shears have a cutting capacity of up to 16 gauge steel. It has a stroke length of 3/32", with 2500 strokes per minute. The shears are designed with ample clearance to cut up to .06" thickness. The tool features a sturdy, lightweight die cast aluminum housing. The switch is operated by squeezing the tool and depressing the paddle. This provides one hand operation, allowing the operator to guide his material with his free hand.

J-10. "Dust-Pak" dust collector

New Dust-Pak, a new completely portable package dust collecting system is for use in small installations or on isolated machines in large plants. It is available with casters where flexibility is desired for special operations. It extracts dust and other particles from the air by a combination centrifugal separation and filtration. It has a replaceable standard "throw-away" type filter. Heavier particles are separated from the air and deposited in a drawer at the base of the unit.

New Industrial Literature

110. Aluminum alloys brochure

New A new illustrated brochure describes the commercial aluminum alloys and explains in detail the general properties, fabricating characteristics, typical applications and available size ranges of each alloy. Also included are alloy designation, weight comparison and temper designation charts.

---

111. Drawing and forming with wax

New A new booklet explaining the functions and advantages of wax in the metal forming operation has been published. It gives reasons of wax's unusual lubricity and explains the benefits of wax in metal forming. The booklet explains the physical functions of wax during the drawing operation and tells why wax provides vital lubrication especially under extreme pressures and high temperatures. Industrial waxes, the booklet states, can withstand pressures as high as 200,000 psi and withstand temperatures in excess of 450°. Case histories tell of economies such as elimination of drawing steps, reductions in down time and increases in die life.

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112. Organic solvents booklet

New This 68-page booklet contains information on the physical properties of the common organic solvents. Written in non-technical language, it also contains explanations, definitions, tables and a discussion of commonly used terms.

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113. "How Zinc Controls Corrosion"

New This 32-page illustrated booklet describes the ways zinc lengthens the life of steel products and reduces maintenance costs. Drawings, charts and photographs together with brief comments present the corrosion control characteristics of zinc coatings, zinc pigments and zinc anodes.

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114. Strippable plastic coating

New A bulletin has been issued which describes strippable plastic coating for the temporary protection of lacquered, painted and enameled surfaces. This sprayed-on viscous water base compound is said to form a tough, resilient, inert film for these surfaces protecting them against scratches, dirt and paint overspray, eliminating expensive refinishing. It gives a finished product, after peeling the film, that "fresh from the factory" look.

---

115. Chemical products for metal finishing

New A manufacturer of chemical products for the metal finishing industry has announced a new piece of pocket-sized literature with descriptions of twenty series of their products. The types of products described cover blackening of all metals, new alkaline cleaners, stripping compounds for plated coatings and for lacquers and enamels, buffing compound removal, products for treating aluminum, alkaline solutions for removing rust and protective compounds for iron and steel.

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116. 12-page bulletin on tooling methods

New A 12-page bulletin illustrates and describes the facilities and equipment of the manufacturer and pictures an assortment of stamped and formed jobs. The subjects illustrated include a range top, heater cabinet, automobile grill bar, refrigerator door panel, steam iron cap and other appliance parts. It is said that each of the parts shown was stamped, drawn or formed with fewer steps and operations than formerly required.

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117. Handbook of oven facts

New A new handbook designed to provide plant management and engineers with basic concepts of industrial heat processing and heat control has been issued. It contains discussions of heat from fuel cost comparisons to design elements. The major consideration in modern oven construction, oven heat control, design objectives, etc., are also covered, as well as common formulas used in calculating heat and oven requirements.

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118. Serving the metal-working industry

New This booklet outlines the manufacturer's compounds which are used in the metal-working industry. Included are alkaline-type cleaners, solvent cleaners, plating materials, phosphating materials, paint strippers, rust preventives, etc. Also included in this illustrated booklet are many charts, such as capacities of rectangular tanks for each foot of liquid and table of drop in air pressure.

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119. New press catalog

New This highly-illustrated catalog VW-55 covers design details, application information and typical parts formed in the manufacturer's presses. It describes how presses are used to reduce rubber pad forming costs. It also pictures mechanical and hydraulic presses and press brakes.

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120. The finishing of stampings

New A new bulletin on the finishing of stamped metal parts by means of the airless abrasive blasting process has been published. It contains four case histories, giving performance data and showing photographs of the equipment they use for this work. The blast cleaning of stampings is done for any of the following reasons: deburring; giving surfaces for such work as welding,

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Planishing improves weld seam quality

(Continued from Page 41)

between the rolls or between the roll and the mandrel once it is started. Roll pressure can be provided by either a pneumatic or hydraulic mechanism. The mandrel support is used when planishing tubular structures too small to slip over the rather massive supporting arm for the lower roll. The mandrel and its supporting fixture is dragged along a guide track by the action of the powered pressure roll. It will be quite evident to any tooling engineer that this planishing mechanism would be easy to incorporate in an automated production line.

Planishing machines with up to 10,000 lbs. direct roll pressure have been built to date. Increasing the total roll pressure would require only a heavier machine frame. But when total roll pressure is 10,000 lbs. the actual pressure in pounds per square inch imparted to the weld seam is much greater, as the area of contact between the roll and the weld seam is only a fraction of a square inch.

In aircraft work weld planishing has proved highly effective on the mild steels, the stainless steels and the various light metal alloys.

Chicago plays host to three big shows

September 6 through 17 are proving to be busy, crowded weeks in Chicago. More than 100,000 production executives and engineers are gathering in Chicago to visit the Production Engineering Show at Navy Pier, the Machine Tool Show at the International Amphitheatre and the Metalworking Machinery and Equipment Exposition at the Coliseum.

The Production Engineering Show features equipment which make machines run automatically. Thousands of instruments, motors, counters and parts are being shown by the 222 companies displaying.

The Machine Tool Show has on display and in operation equipment valued at more than $20,000,000. It is an exhibit of over 500 machine tools of the very latest design built by 175 manufacturers of metalworking equipment who last displayed their products eight years ago at the 1947 Machine Tool Show which was held in the Dodge Chicago plant.

Mr. M. A. Hollengreen, president of the National Machine Tool Builders Association said, "Demonstrated advances in productivity are amazing. In case after case the new machine will do a job in a third, a tenth or even a fiftieth of the time formerly required. Never have advances in machine tool design been so rapid as in the last five years."

Outstanding features which impressed visitors were the advances in automatic controls, step-up in accuracy which is now measured in millionths of an inch instead of thousandths and a general increase in the size of the machines.

Officers of the National Machine Tool Builders' Association are: M. A. Hollengreen, president and general manager, Landis Tool Co., president; Louis Polk, president, The Sheffield Corp., 1st vice president; Jerome A. Raterman, president, The Monarch Machine Tool Co., 2nd vice president; Perrin G. March, III, president, The Cincinnati Shaper Co., treasurer. Chairman of the show committee for the association was William E. Rutz, executive vice president, Giddings & Lewis Machine Tool Co.

ALCOA SALES APPOINTMENTS

Appointment of Robert L. Williamson as manager of pig and ingot sales and John S. Hamilton as manager of foil product sales has been announced by Aluminum Co. of America.

from the Editor's Mail

(Continued from Page 22)

fluorescent lighting

Gentlemen:

I would like very much to have a reprint or tear sheets of an article which appeared in the June issue of your magazine. I do not know the exact title of the article, but it was in connection with a painting system for a fluorescent light plant.

W. H. Dickinson
Director — Manufacturing Engr.
Westinghouse Electric Corp.
Pittsburgh, Pennsylvania

---

control of nickel flashing

Gentlemen:

Will you please advise if copies are available of an article entitled, "Growth of Nickel Flashing — and Its Proper Control", by J. J. Canfield of Armco Steel Corporation. This article apeared in the November, 1954, issue of *finish*.

If such copies can be obtained please advise. Thanks a lot.

Ernest W. Partsch
Design Engineer
Midwest Mfg. Corporation
Galesburg, Illinois

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helpful in set-up and production problems

Gentlemen:

As of August 29, 1955, I will be with the General Electric Company of Bloomington, Illinois.

Your magazine *finish* has been very helpful to me in the set-up and production problems in the Punch Press Department. I will appreciate very much if I could continue receiving it.

Stanley D. Shephard
(formerly with Thor Corp.)

---

key to contract mfg. — diversifications

Gentlemen:

I would like to take this opportunity of complimenting you for the excellent presentation in the August issue of *finish* on our material and pictures which you so aptly displayed on "The Key to Contract Manufacturing — Diversification" as submitted by us.

We have received numerous calls and congratulatory notes from the

to Page 108 (Col. 3) →

Record attendance at PEI annual forum

an editor's report received while october *finish* was on the presses

THE 17th Annual Shop Practice Forum of the Porcelain Enamel Institute held at Columbus, Ohio, September 14, 15 and 16, enjoyed a record attendance of 275.

The Department of Ceramic Engineering of Ohio State University acted as the host for this year's meeting. Professor R. M. King of the Ceramic Engineering Department (Technical Consultant for *finish*) handled the university arrangements and also presided over the Wednesday afternoon session.

The program schedule was aimed at full interchange of ideas to bring the practical enameler up to date on the latest activities and developments in the industry. Over 35 speakers — representatives of appliance, general enameling and plumbing ware companies, government and university officials, and supplier and equipment manufacturers for the industry and others — presented information much of which is directly usable and of practical value to men closely connected with the processing operations in enameling plants. This year's program was under the chairmanship of E. E. Howe of Chicago Vitreous Corp.

The opening afternoon session again featured a popular series of concise reports "Briefs For Industry." The late afternoon session covered one of the newer developments of the industry, the porcelain enameling of aluminum. Many of the papers on this year's program were designed for delivery in approximately 5 minutes and it was impressive to note the amount of detail and important data that can be included in papers of this length when necessary.

Thursday morning's session was a general interest forum with presentation of subjects such as "A Look Ahead For Porcelain Enamel" by A. S. Ault, Chicago Vitreous Corporation and "Overcoming Health Hazards in the Enameling Plant" by H. S. Kline, Frigidaire Division, General Motors Corporation. These were followed by several papers about one-coat processing of porcelain enamel.

The Thursday afternoon session was devoted to nine papers, the results of studies and processing techniques and test methods. A report on the work of the Process Development Committee, headed by J. L. McLaughlin, Allied Porcenell, Inc., was included in this session.

Three speakers, including T. J. Snodgrass and K. C. Reifsteck of General Electric Company, and W. L. Smart of Ransburg Electro-Coating Corporation, presented information on interesting current operations in the Home Laundry Division of General Electric at Louisville. The description centered around flow coating of porcelain enamel ground coat and the electrostatic spraying of home laundry components.

At the Friday morning session, the Institute's Expanded Weathering Test Program for all types of porcelain enamels was presented in detail. The Forum ended Friday morning with a number of papers of the very important and timely subject of "Color in Porcelain Enamel."

A lively discussion following the majority of the program sections indicated the current interest in the majority of the program topics *(detailed reports on selected subject material from the Forum will appear in later issues of* finish).

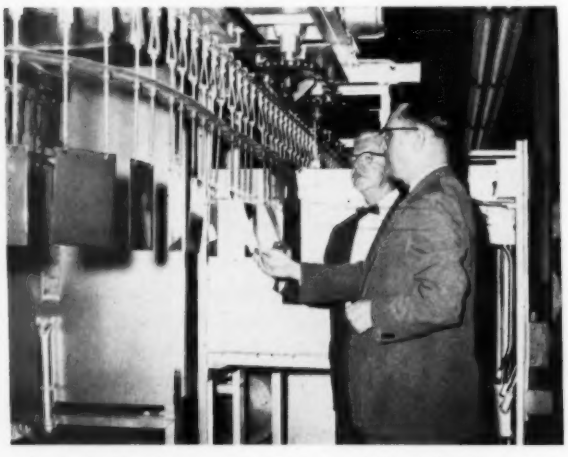
"BIGGEST" — "LITTLE" FURNACE CHRISTENED AT FERRO

The largest electric laboratory continuous furnace, for porcelain enameling aluminum and steel, was christened recently by C. D. Clawson, president, Ferro Corp., Cleveland.

The furnace which is 27 feet long and 3 feet wide was designed and erected by the company's engineering department. It is said to be the only laboratory furnace with pre-heat and cooling zones, simulating production continuous furnace. Steel and aluminum porcelain enamels can be fired in this furnace through the use of a separate heating unit for aluminum, which takes a lower fusing temperature.

The development laboratory will use the furnace to study the atmospheric and moisture conditions, for firing cycles in color matching to compare to production firing and also to study the effect of convection heating on aluminum enamels.

Ferro reports that currently one square foot of floor space is devoted to research, development and engineering to every five square feet of space devoted to manufacture. For every fifteen hourly workers in the manufacturing operation there are thirteen laboratory or engineering employees.



Above: C. D. Clawson, president, and H. T. Marks, executive vice president, Ferro, inspect sample panels on new laboratory continuous furnace.

Below: William Noble, vice president in charge of frit division, showing district managers the fine points of the furnace — Woody Wilson, Eddie Davision, G. Johnson, S. Smith.

SUPPLIER NEWS

BINKS FALL SPRAY PAINTING SCHOOL

Binks Mfg. Co.'s free School of Spray Painting will be held at the company's main plant in Chicago on the following dates: October 3-7, November 7-11 and December 5-9.

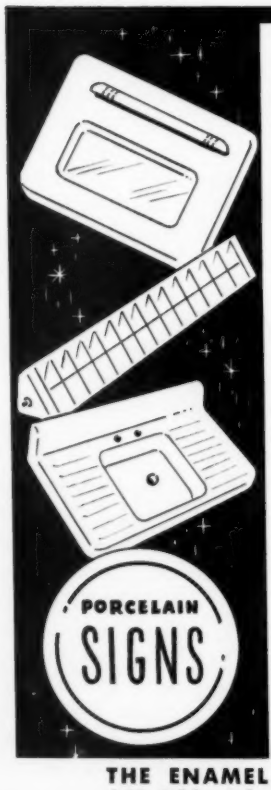
In addition to a course in actual spray painting, both manual and automatic, students learn the operation and servicing of spray guns, paint circulating systems, material handling pumps, oil and water extractors, flocking equipment, compressors and all auxiliary equipment.

INLAND STEEL OFFICE BLDG.

Inland Steel Co. has announced the construction of a new headquarters office building Chicago.

ARMCO UPS PARDONNER

Paul F. Pardonner has been named manager of the Detroit sales district of Armco Steel Corp., Middletown, Ohio, W. B. Quail, manager of the sales division, has announced.



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your product
COLOR.. our specialty

● Specialists in porcelain enameling... white or color... since 1912. Top quality and service guaranteed. Our factories exceed 152,000 sq. ft. of floor space. Latest equipment includes production spraying and dipping.

In our finishing department we have automatic conveyor lines; straight through, hairpin and box furnaces, all electrically fired. Excellent shipping facilities including 10 car RR siding. Well rated company in the best location in the nation.

Let us quote on all of your porcelain enameling, or on short runs to pick up your peak loads. No obligation.

Write today to

THE ENAMEL PRODUCTS CO.
341 Eddy Rd., Cleveland 8, Ohio

→ *frome Page 103*

brazing, painting, rubberizing, plating, glass coating and the application of other surface coatings; cleaning them of their heat treat scale; or cleaning them of rust which may have occurred during storage.

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121. Utility folder

New A new 3-part utility folder designed for the metal finishing and plating department is now available. It can be used for three purposes: a stock record to help plants check their finishing supplies inventory, an emergency First Aid wall chart outlining treatment for plating room accidents, or a file folder to file technical bulletins and sales literature.

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122. "Polyfax — The Key to Distinctive Styling"

New A new illustrated brochure entitled "Polyfax — The Key to Distinctive Styling" has been issued. It gives the story of Polyfax, an offset-gravure process for printing wood-grains, fabric designs, leather, marble, cane or basket-weaves and many other attractive patterns on metal, wood composition board or plastics. Materials and equipment are described, and end-uses are suggested.

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123. 30-page catalog on fasteners

New A thirty-page, two-color catalog lists a complete range of fasteners including machine screws and A & B tapping screws, Phillips and slotted and stove bolts, available in steel, brass, silicon bronze, aluminum and stainless steel. Under decorative finishes are listed blued steel, spartan gray, statuary bronze or antique copper and black oxidized. Rust resistant finishes are hot galvanized, electo galvanized, a zinc type of coating, zinc plated, and Parkerized. Rust resistant and decorative finishes are nickel plated, brass plated, cadmium plated and chromium plated.

124. "Packaging and Carloading Guide"

New This new booklet contains forty-four illustrated pages of usable facts that can help lower freight bills, end pilferage, reduce loss and damage claims, reduce container costs and speed packaging and shipping. It shows how to apply strapping to containers, brace open top and closed freight carloads and barricade car doorways to protect all types of packaged and bulk commodities. It pictures a complete line of hand and power strapping tools and machines, strapping, seals and accessories.

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125. Heating unit catalog

New A catalog and price list covering replacement heating elements for electric apliances has been issued. Replacement units for toasters, percolators, hot plates, flat irons, room heaters, ironers, clothes dryers and various other appliances together with replacement spools and replacement coils for general use are included in the catalog.

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126. Speedbin Kits

New New Speedbin Kits based on time study and motion economy principles are ready for distribution. They come complete, ready to be put together and can be easily reset for each new assembly operation. Once set up the parts are gravity fed to the operator, and the rate of flow of the parts is controlled by an adjustable shutter. Also the Bins can be fed from the back without disturbing production even when stacked vertically.

All of the parts are interchangeable, allowing for any variation in the number of Bins and the type of setup desired. Each Kit provides for 30" of bin width. Bins are 6" deep, plus a 3" projecting tray.

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127. Paint spraying catalog

New A new illustrated catalog featuring a new line of paint spraying equipment has been issued. It gives complete descriptions of spray guns, compressors, accessories and safety devices. The paint spray guns feature an interchangeable line of self-centering tapered seat air nozzles, fluid tips and needles.

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128. Catalog on roller conveyors

New A new catalog on medium and heavy duty roller conveyors has been issued. Twenty pages of data and specifications on the complete line describe the various types giving capacities of rollers and bearings. Detailed cutaway views show the dustproof bearings with true-labyrinth metal seal, and integral and plain ball bearings. Charts give roller and frame capacities. Heavy duty type mobile unit for straight sections of roller conveyor is illustrated.

FINISH
York Street at Park Avenue
Elmhurst, Illinois

Please forward to me at once information on the new supplies and equipment and new industrial literature as enumerated below:

No._____ **No.**_____ **No.**_____ **No.**_____

No._____ **No.**_____ **No.**_____ **No.**_____

Name _____ **Title** _____

Company _____

Company Address _____

City _____ **Zone**____ **State** _____

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Customer Service YORK ST. AT PARK AVE., ELMHURST, ILLINOIS

"I saw your ad in finish"

Editor's mail

→ *from Page 104*

industry on this article. This of course has been very gratifying to us and we in turn are very pleased to pass this information on to you.

J. J. Boehler
Manager, Appliance Division
Heintz Mfg. Company
Philadelphia, Penna.

home laundry industry

Gentlemen:

I would like to compliment you and your editorial staff on the excellent coverage which you gave to the Home Laundry Industry in your September issue.

If additional copies of this issue are available, I would very much appreciate receiving 4 copies for distribution to some of our executives.

Douglas M. Considine
Merchandising Manager
P. R. Mallory & Co., Inc.
Indianapolis, Indiana

CLASSIFIED ADVERTISING

WANTED

CERAMIC ENGINEERS — recent graduates or up to 3 years experience — for development work on porcelain enamel materials, processes and products in the Engineering Department Laboratory. Provide personal and experience data, and address the **Employment Director, Frigidaire Division of General Motors, Dayton 1, Ohio**

CLEARING MACHINE EXPANDS

A $3 million expansion program for Clearing Machine Corp., division of U. S. Industries, Inc., Chicago, was recently announced by John L. Snyder, Jr., chairman of the board and president of U. S. Industries.

Expansion includes a 61,000 square foot building adjacent to the present plant and purchase of new machine tool equipment.

See editorial coverage of PEI Forum in November finish.